GLENCOE MATHEMATICS

Pre-Algebra

Chapter 13 Resource Masters

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Consumable Workbooks

Many of the worksheets contained in the Chapter Resource Masters booklets are available as consumable workbooks in both English and Spanish.

Study Guide and Intervention Workbook	0-07-827794-9
Study Guide and Intervention Workbook (Spanish)	0-07-827795-7
Skills Practice Workbook	0-07-827788-4
Skills Practice Workbook (Spanish)	0-07-827790-6
Practice Workbook	0-07-827789-2
Practice Workbook (Spanish)	0-07-827791-4

Answers for Workbooks The answers for Chapter 13 of these workbooks can be found in the back of this Chapter Resource Masters booklet.

Spanish Assessment Masters Spanish versions of forms 2A and 2C of the Chapter 13 Test are available in the *Pre-Algebra Spanish Assessment Masters* (0-07-830412-1).

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Teacher's Guide to Using the *Chapter 13 Resource Masters*

The ***Fast File*** Chapter Resource system allows you to conveniently file the resources you use most often. The *Chapter 13 Resource Masters* includes the core materials needed for Chapter 13. These materials include worksheets, extensions, and assessment options. The answers for these pages appear at the back of this booklet.

All of the materials found in this booklet are included for viewing and printing in the *Pre-Algebra TeacherWorks* CD-ROM.

Vocabulary Builder Pages vii-viii include a student study tool that presents up to twenty of the key vocabulary terms from the chapter. Students are to record definitions and/or examples for each term. You may suggest that students highlight or star the terms with which they are not familiar.

When to Use Give these pages to students before beginning Lesson 13-1. Encourage them to add these pages to their Pre-Algebra Study Notebook. Remind them to add definitions and examples as they complete each lesson.

Study Guide and Intervention

Each lesson in Pre-Algebra addresses one or two objectives. There is one Study Guide and Intervention master for each lesson.

When to Use Use these masters as reteaching activities for students who need additional reinforcement. These pages can also be used in conjunction with the Student Edition as an instructional tool for students who have been absent.

Skills Practice There is one master for each lesson. These provide computational practice at a basic level.

When to Use These masters can be used with students who have weaker mathematics backgrounds or need additional reinforcement.

Practice There is one master for each lesson. These problems more closely follow the structure of the Practice and Apply section of the Student Edition exercises. These exercises are of average difficulty.

When to Use These provide additional practice options or may be used as homework for second day teaching of the lesson.

Reading to Learn Mathematics

One master is included for each lesson. The first section of each master asks questions about the opening paragraph of the lesson in the Student Edition. Additional questions ask students to interpret the context of and relationships among terms in the lesson. Finally, students are asked to summarize what they have learned using various representation techniques.

When to Use This master can be used as a study tool when presenting the lesson or as an informal reading assessment after presenting the lesson. It is also a helpful tool for ELL (English Language Learner) students.

Enrichment There is one extension master for each lesson. These activities may extend the concepts in the lesson, offer an historical or multicultural look at the concepts, or widen students' perspectives on the mathematics they are learning. These are not written exclusively for honors students, but are accessible for use with all levels of students.

When to Use These may be used as extra credit, short-term projects, or as activities for days when class periods are shortened.

Assessment Options

The assessment masters in the *Chapter 13 Resource Masters* offer a wide range of assessment tools for intermediate and final assessment. The following lists describe each assessment master and its intended use.

Chapter Assessment

Chapter Tests

- *Form 1* contains multiple-choice questions and is intended for use with basic level students.
- *Forms 2A and 2B* contain multiple-choice questions aimed at the average level student. These tests are similar in format to offer comparable testing situations.
- *Forms 2C and 2D* are composed of free-response questions aimed at the average level student. These tests are similar in format to offer comparable testing situations. Grids with axes are provided for questions assessing graphing skills.
- *Form 3* is an advanced level test with free-response questions. Grids without axes are provided for questions assessing graphing skills.

  All of the above tests include a free-response Bonus question.

- The **Open-Ended Assessment** includes performance assessment tasks that are suitable for all students. A scoring rubric is included for evaluation guidelines. Sample answers are provided for assessment.
- A **Vocabulary Test**, suitable for all students, includes a list of the vocabulary words in the chapter and ten questions assessing students' knowledge of those terms. This can also be used in conjunction with one of the chapter tests or as a review worksheet.

Intermediate Assessment

- Four free-response **quizzes** are included to offer assessment at appropriate intervals in the chapter.
- A **Mid-Chapter Test** provides an option to assess the first half of the chapter. It is composed of both multiple-choice and free-response questions.

Continuing Assessment

- The **Cumulative Review** provides students an opportunity to reinforce and retain skills as they proceed through their study of Pre-Algebra. It can also be used as a test. This master includes free-response questions.
- The **Standardized Test Practice** offers continuing review of pre-algebra concepts in various formats, which may appear on the standardized tests that they may encounter. This practice includes multiple-choice, grid-in, and open-ended questions. Bubble-in and grid-in answer sections are provided on the master.

Answers

- Page A1 is an answer sheet for the Standardized Test Practice questions that appear in the Student Edition on pages 702–703. This improves students' familiarity with the answer formats they may encounter in test taking.
- The answers for the lesson-by-lesson masters are provided as reduced pages with answers appearing in red.
- Full-size answer keys are provided for the assessment masters in this booklet.

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13

Reading to Learn Mathematics

Vocabulary Builder

This is an alphabetical list of key vocabulary terms you will learn in Chapter 13. As you study this chapter, complete each term's definition or description. Remember to add the page number where you found the term. Add these pages to your Pre-Algebra Study Notebook to review vocabulary at the end of the chapter.

Vocabulary Term	Found on Page	Definition/Description/Example
binomial by-NOH-mee-uhl		
cubic function KYOO-bihk		
degree		

Vocabulary Builder *(continued)*

Vocabulary Term	Found on Page	Definition/Description/Example
nonlinear function		
polynomial PAHL-uh-NOH-mee-uhl		
quadratic function kwah-DRAT-ihk		
trinomial try-NOH-mee-uhl		

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13-1 Study Guide and Intervention

Polynomials

Polynomials are classified according to the number of terms they have. A *monomial* has one term, a *binomial* has two terms, and a *trinomial* has three terms. The exponent of a variable in a monomial must be a whole number, and the variable cannot be in the denominator or under a radical sign.

Example 1 **Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.**

a. $2y + \frac{3}{y}$

The expression is not a polynomial because $\frac{3}{y}$ has a variable in the denominator.

b. $\frac{3a}{4} + 6a^3 - 5a^4$

The expression is a polynomial with three terms, so it is a trinomial.

A polynomial also has a degree. The degree of a polynomial is the same as that of the term with the greatest degree. The degree of a term is the sum of the exponents of its variables.

Example 2 **Find the degree of each polynomial.**

a. $x^6 - 3x^4 + 1$

The greatest degree is 6, so the degree of the trinomial is 6.

b. $10b^2c + 8bc - c^2$

$10b^2c$ has degree 2 + 1 or 3. $8bc$ has degree 1 + 1 or 2. c^2 has degree 2.

The greatest degree is 3, so the trinomial has degree 3.

Exercises

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $7q + r - 10$ **2.** $\sqrt{8r}$ **3.** $x^2 - 4$

4. -89 **5.** $3v^2 + 4w$ **6.** $a^5 + b^2 + c$

Find the degree of each polynomial.

7. $28y$ **8.** $-5h$ **9.** $2x^3y$

10. $9p^3 - 6p^2$ **11.** $mn^5 + mn^4 + m^2$ **12.** $8x^2 + 4xy - y^2$

Lesson 13-1

NAME _____ DATE _____ PERIOD _____

13-1 Skills Practice

Polynomials

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $-5g^8$

2. $x + 2y + z$

3. $5x + 1 + \frac{4}{x}$

4. $r^2 - 9r$

5. $d + 1$

6. $a^3b^2 + a^2$

7. n

8. $17 - \sqrt{c}$

9. $a + b^2 - 3$

10. $m + 2\sqrt{m}$

11. $5y^2 - 3y + 1$

12. $a - b + c$

13. $24x^3$

14. $25 - 9h^4$

15. $u^5 + u^3 + u$

16. $\frac{3x^3}{4} + \frac{x}{2} + \frac{1}{8}$

17. $\frac{x}{5} + \frac{1}{2}$

18. $\frac{6}{a^2} - \frac{1}{a} + \frac{1}{3}$

19. 1

20. $9y - \sqrt{5}$

21. $27g^5h^2$

Find the degree of each polynomial.

22. 14

23. ab

24. b

25. $c^3 + c^2 + c + 1$

26. mn^5

27. $xy^3z + 1$

28. $k - 4$

29. $\frac{-5}{6}$

30. 9.7

31. $c^6de^3 + c^5 + d$

32. $a^2 - 2a + 3$

33. $k^3 + 3k^4$

34. $xy^2 + 4x^2y + y^2$

35. $7b^5 - 10$

36. $16g + 3$

37. $8y^2 + 8y - 5$

38. $abc + 2ab + 5c - bc + 1$

39. $-4g^2h^5 + 2gh^4 + 9$

NAME _____ DATE _____ PERIOD _____

13-1 Practice

Polynomials

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $-3n^2$

2. $v^2 - 9v$

3. $g + 2h + jk$

4. $6b + 2 + \frac{8}{b}$

5. $m + 10$

6. $a^2b^2 + 9$

7. $1 + \sqrt{s}$

8. q

9. $h + h^2 + 1$

10. $m + n - p$

11. $y^4 + 5y - 2$

12. $x - \sqrt{x}$

13. $-5w^7t$

14. $41 - qr^4$

15. $p^4 + p^2 + p$

16. $\frac{2x^2}{7} + \frac{5x}{7} + \frac{3}{7}$

17. $\frac{v}{5} + \frac{1}{2}$

18. $10k - \sqrt{6}$

19. 4

20. $\frac{3}{c^2} - \frac{5}{c} - \frac{1}{2}$

21. $7g^2h^7$

Find the degree of each polynomial.

22. -52

23. xy

24. c

25. $2c^5 - c^3 - c - 9$

26. ab^3

27. $2xy^4z^3 + 7$

28. $r - 25$

29. $\frac{-4}{9}$

30. 12.4

31. $12 + 9t - t^2$

32. $5a^3 - a + 8$

33. $1 - c^2 + c^4$

34. $xy^2 - 3x^2y + xy$

35. $b^5 + b - 1.5$

36. $15k + 2$

37. $cde^8 + c^4 + 2e$

38. $wxyz - 2wx - 5y - yz + 4$

39. $-6g^2h^8 + gh^5 + 3$

40. **METEOROLOGY** *Summer simmer index* measures the discomfort level due to temperature and humidity. Meteorologists calculate this value by using a polynomial similar to $1.98x^2 - 115.93x + 0.01xy - 0.63y + 6.33$. The variable x is the temperature in °F and y is the relative humidity expressed as a whole number. What is the degree of the polynomial?

Lesson 13-1

NAME _____ DATE _____ PERIOD _____

13-1 Reading to Learn Mathematics

Polynomials

Pre-Activity

How are polynomials used to approximate real-world data?

Do the activity at the top of page 669 in your textbook. Write your answers below.

a. How many terms are in the expression for the heat index?

b. What separates the terms of the expression?

Reading the Lesson

Write a definition and give an example of each new vocabulary word.

Vocabulary	Definition	Example
1. polynomial		
2. binomial		
3. trinomial		
4. degree		

Helping You Remember

5. Notice that the words *binomial, trinomial,* and *polynomial* contain the same root—*nomial,* but have different prefixes.

a. Find the definition of the prefix *bi-* in a dictionary. Write the definition. Explain how it can help you remember the meaning of *binomial*.

b. Find the definition of the prefix *tri-* in a dictionary. Write the definition. Explain how it can help you remember the meaning of *trinomial*.

c. Find the definition of the prefix *poly-* in a dictionary. Write the definition. Explain how it can help you remember the meaning of *polynomial*.

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13-1 Enrichment

A Cross-Number Puzzle

Use the clues at the bottom of the page to complete the puzzle. Write one digit in each box.

A			B			C	D			E	F
							G	H			
I	J			K						L	
			M				N				
	O				P		Q	R			S
T				U			V			W	

Across

A $x^2 - 4$ for $x = 5$

B $3xy^2$ for $x = 4$ and $y = -1$

C $(2x + 50) + (x - 15)$ for $x = 0$

E $x^2 - 4x - y^2$ for $x = 10$ and $y = 5$

G x^2y for $x = 3$ and $y = 7$

I $10w + 5y$ for $w = 6$ and $y = 1$

K $3x^2 + 5x + 8$ for $x = -10$

L $(y - 8) + (10 - 4y)$ for $y = -6$

M $23x - 16x$ for $x = 11$

O $7x + 100y$ for $x = 5$ and $y = 6$

Q $(6x^2 - 2) + (4x^2 - 3)$ for $x = -7$

T $(x^2 - x + 7) + (x^2 - 2)$ for $x = 3$

U x^2y for $x = -2$ and $y = 8$

V $7y - 12y - 2$ for $y = -10$

W $w^2 - w - 7$ for $w = 9$

Down

A $(6x^2 - 1) + (4x^2 - 3)$ for $x = 5$

B $7y + 8y - 2$ for $y = 1$

D $x + x^2y^2$ for $x = 7$ and $y = 1$

F $5(7w + 3w)$ for $w = 10$

H $(z^2 + 2z + 1) + (z^2 - 2z - 2)$ for $z = 4$

J $6xy^2 - xy + 60$ for $x = 10$ and $y = 10$

K $w^2 - w - 3$ for $w = 6$

L $(3y - 20) + (45 - 3y)$ for $y = 16$

M $11x^2 - 8x^2$ for $x = -5$

N $x^2 - 2x + y^2$ for $x = 10$ and $y = 8$

P $(2x + 52) + (x - 11)$ for $x = -3$

R $2x^2 - 5x - 140$ for $x = 12$

S $(y - 75) + (120 + 4y)$ for $y = -6$

Lesson 13-1

NAME _____ DATE _____ PERIOD _____

13-2 Study Guide and Intervention

Adding Polynomials

Add polynomials by combining like terms, which are monomials that contain the same variables to the same power.

Example **Find $(8x^2 - 7x + 1) + (x^2 + 5)$.**

Method 1 Add vertically.

$$\begin{array}{r} 8x^2 - 7x + 1 \\ (+)\ x^2 \qquad + 5 \\ \hline 9x^2 - 7x + 6 \end{array}$$

Method 2 Add horizontally.

$(8x^2 - 7x + 1) + (x^2 + 5)$
$= (8x^2 + x^2) - 7x + (1 + 5)$
$= 9x^2 - 7x + 6$

Exercises

Find each sum.

1. $\begin{array}{r} 3x - 7 \\ (+)\ x + 1 \\ \hline \end{array}$

2. $\begin{array}{r} 6d + 8 \\ (+)\ -4d + 1 \\ \hline \end{array}$

3. $\begin{array}{r} 4w^2 - 6w + 3 \\ (+)\ w^2 \qquad - 5 \\ \hline \end{array}$

4. $\begin{array}{r} 5a^2 - a \\ (+) \qquad 2a - 5 \\ \hline \end{array}$

5. $(-m + 3) + (7m - 1)$

6. $(9x^2 + 3x - 1) + (4x + 1)$

7. $(2k^2 - k) + (k - 1)$

8. $(5a^2 + 6ab) + (-ab + b^2)$

9. $(4c^2 - 7) + (c^2 - 3c + 6)$

10. $(x^2 + y) + (xy + y)$

11. $(12h - 6) + (h^2 - 8h + 6)$

12. $(10x^2 + x + 5) + (x - 10x^2)$

13. $(6y^2 - y + 1) + (y^2 - 3y - 6)$

14. $(p^3 + 4) + (2p^2 - 2p + 3)$

15. $(3g^2 + 3g + 5) + (5g^2 - 3)$

16. $(5r^2 - 6) + (-r^2 - 4r + 7)$

NAME _____ DATE _____ PERIOD _____

13-2 Skills Practice

Adding Polynomials

Find each sum.

1. $5q + 7$
$(+)\ 2q - 2$

2. $7f - 10$
$(+) -2f + 3$

3. $r^2 - 3r$
$(+)\ r^2 + 4r - 1$

4. $9n^2 - 3n$
$(+)\ \ 3n - 5$

5. $w^2 - 3w + 3$
$(+)\ w^2 + 4w + 1$

6. $8c^2 - 4c + 6$
$(+)\ c^2 + c - 1$

7. $-p^2 + 6p + 8$
$(+)\ p^2 - 4p - 5$

8. $3v^2 + v$
$(+) -2v + 7$

9. $6m^2 + m + 1$
$(+) 2m^2 - 2m - 3$

10. $5d^2 + 7d - 4$
$(+)\ 5d^2 - 6d - 4$

11. $(2r^2 - 3) + (-r^2 + 4r + 1)$

12. $(g^2 + 2g + 5) + (5g^2 - 2g + 3)$

13. $(-m - 9) + (3m - 3)$

14. $(2x^2 + 8x - 7) + (3x + 5)$

15. $(k^2 - k) + (7k^2 - k - 2)$

16. $(4a^2 + 3ab) + (ab + 2b^2)$

17. $(5c - 7) + (3c^2 - 4c + 6)$

18. $(x^2 + xy) + (xy + y^2)$

19. $(-h^2 + 3h - 6) + (4h^2 - 2h + 3)$

20. $(x^2 + x + 1) + (2x - 9x^2)$

21. $(6g^2 - 2g - 3) + (2g^2 + 5g)$

22. $(b^2 + b + 1) + (b^2 - b - 1)$

23. $(2y^2 - 7y + 9) + (y^2 - 4y - 6)$

24. $(7p^3 - 4) + (2p^2 + 5p + 1)$

Lesson 13-2

NAME _____ DATE _____ PERIOD _____

13-2 Practice

Adding Polynomials

Find each sum.

1. $8q + 3$
$(+)\ 4q - 2$

2. $9f - 3$
$(+)\ -f - 15$

3. $4r^2 + 11r$
$(+)\ 5r^2 - 3r - 7$

4. $n^2 - 3n$
$(+)\ 3n - 10$

5. $6w^2 + 2w + 7$
$(+) 8w^2 + 3w - 9$

6. $8c^2 - 3c + 15$
$(+)\ 3c^2 + 3c - 11$

7. $-5p^2 - 2p + 4$
$(+)\ 5p^2 + 2p - 4$

8. $7v^2 - 2v$
$(+)\ 7v^2 - v + 5$

9. $5m^2 + 6m - 3$
$(+) 8m^2 + 9m - 2$

10. $7d^2 + 8d - 3$
$(+)\ d^2 + d + 3$

11. $(r^2 + 9) + (-4r^2 + 6r + 10)$

12. $(g^2 + 3g - 6) + (6g^2 - 6g + 1)$

13. $(-2m + 10) + (5m - 3)$

14. $(4x^2 - 7x) + (8x + 5)$

15. $(3k^2 + 9k) + (k^2 - 2k - 4)$

16. $(2a^2 - 3ab) + (4ab - 8b^2)$

17. $(c + 4) + (c^2 - c + 6)$

18. $(5x^2 - 3xy) + (2xy + 9y^2)$

19. $(2y^3 + y^2 + 5) + (2y^2 + 3y)$

20. $(-5p^2 + 6p - 7) + (p^2 - 2)$

21. $(3ab^2 - 2a - 1) + (a^2 + ab + 3)$

22. $(6rs^3 + 4r) + (5rs^3 + 7)$

23. GEOMETRY The lengths of the sides of a triangle are $(x^2 - 5)$, $(7x - 1)$, and x. Find the perimeter of the triangle.

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13-2

Reading to Learn Mathematics

Adding Polynomials

Pre-Activity

How can you use algebra tiles to add polynomials?

Do the activity at the top of page 674 in your textbook. Write your answers below.

a. Write the polynomial for the tiles that remain.

b. Find the sum of $x^2 + 4x + 2$ and $7x^2 - 2x + 3$ by using algebra tiles.

c. Compare and contrast finding the sums of polynomials with finding the sum of integers.

Reading the Lesson

1. Draw a model that shows $(x^2 - 4x + 2) + (2x^2 + 2x - 3)$. Write the polynomial that shows the sum.

2. Show how to find the sum $(5x - 2) + (4x + 4)$ both vertically and horizontally.

Vertically **Horizontally**

Helping You Remember

3. You have learned that you can combine like terms. On the left below, write three pairs of monomials that have like terms. On the right below, write three pairs of monomials that have unlike terms. Explain your answers.

Like Terms	Unlike Terms
1.	**1.**
2.	**2.**
3.	**3.**

Lesson 13-2

NAME _____ DATE _____ PERIOD _____

13-2 Enrichment

Adding Polynomials

Can you make a sentence using these words?

A FRUIT TIME LIKE AN BUT FLIES BANANA ARROW LIKE FLIES

Add the polynomials. Then find the word in the table at the right that corresponds to the sum. Read the words in order down the column to discover the hidden saying.

1. $(2x^2 + 3x^2) + (5x^2 + x^2)$

2. $(2x^2 + 3x^3) + (5x^2 + x^2)$

3. $(2x^2 + x) + (xy + x)$

4. $(x^3 + 2x^2) + (5x^3 + x)$

5. $(x + xy) + (x^2 + xy)$

6. $(5x^2 + x) + (x + 2x^4)$

7. $(xy + y^2 + x^2) + (2xy + x^2)$

8. $(3x^2 + 2x^3) + (x^3 + x)$

9. $(x + x^2) + x^3$

10. $(x^3 + x^3) + (x^3 + x^3)$

11. $2x^{12} + 2x^{12}$

Word	
$4x^3$	A
$2x^2 + 3xy + y^2$	FRUIT
$11x^2$	TIME
$x^3 + x^2 + x$	LIKE
$6x^3 + 2x^2 + x$	AN
$2x^4 + 5x^2 + 2x$	BUT
$3x^3 + 8x^2$	FLIES
$4x^{12}$	BANANA
$x^2 + 2xy + x$	ARROW
$2x^2 + 2x + xy$	LIKE
$3x^3 + 3x^2 + x$	FLIES

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13-3 Study Guide and Intervention

Subtracting Polynomials

To subtract polynomials, subtract like terms.

Example **Find $(x^2 + 3x - 6) - (4x^2 - 1)$.**

Method 1 Subtract vertically.

$$\begin{array}{r} x^2 + 3x - 6 \\ (-)\ 4x^2 \qquad - 1 \\ \hline -3x^2 + 3x - 5 \end{array}$$

Method 2 Add the additive inverse of $4x^2 - 1$, which is $(-1)(4x^2 - 1)$ or $-4x^2 + 1$.

$$\begin{aligned} &= (x^2 + 3x - 6) - (4x^2 - 1) \\ &= (x^2 + 3x - 6) + (-4x^2 + 1) \\ &= (x^2 - 4x^2) + (3x) + (-6 + 1) \\ &= -3x^2 + 3x - 5 \end{aligned}$$

Exercises

Find each difference.

1. $\begin{array}{r} 4c + 7 \\ (-)\ 3c + 3 \\ \hline \end{array}$

2. $\begin{array}{r} 2m + 5 \\ (-)\ -8m + 1 \\ \hline \end{array}$

3. $\begin{array}{r} 9k^2 - 4k + 5 \\ (-) \quad k^2 \qquad - 5 \\ \hline \end{array}$

4. $\begin{array}{r} 3z^2 - z \\ (-) \qquad 3z - 5 \\ \hline \end{array}$

5. $(-6r + 3) - (7r + 2)$

6. $(8f^2 - 7f - 3) - (2f + 4)$

7. $(5n^2 - 2n) - (3n + 9)$

8. $(a^2 + 5ab) - (-2ab - 3b^2)$

9. $(6g^2 + 8) - (5g^2 - 2g + 6)$

10. $(8x^2 - 3y) - (2xy + 3y)$

11. $(n - 12) - (n^2 + n + 9)$

12. $(h^2 - 2h + 1) - (3h - 7h^2)$

13. $(y^2 + y + 1) - (y^2 - y + 1)$

14. $(6p^2 - 5p - 1) - (2p - 4)$

15. $(4q^2 + q) - (q^2 + 3)$

16. $(6v^2 + 8) - (7v^2 + 2v - 5)$

17. $(u^2 + u - 4) - (5u^2 - 4)$

18. $(9b^2 + 2) - (-b^2 + b + 9)$

Lesson 13-3

NAME _____ DATE _____ PERIOD _____

13-3 Skills Practice

Subtracting Polynomials

Find each difference.

1. $7y + 5$
$(-)\ y + 6$

2. $k + 8$
$(-)\ 2k - 9$

3. $w^2 + w + 1$
$(-)\ 2w^2 + 3w + 2$

4. $c^2 - 7c + 2$
$(-)\ -c^2 - c - 1$

5. $3d^2 - d$
$(-)\ d^2 - 3d - 8$

6. $7n^2 - 3n$
$(-)\ -n^2 - 3n - 1$

7. $2m^2 - 5m + 3$
$(-)\ 5m^2 - m - 3$

8. $d^2 - 3d - 6$
$(-)\ d^2 - 2d - 1$

9. $-q^2 + 2q + 2$
$(-)\ q^2 - 7q + 9$

10. $v^2 + v$
$(-)\ 8v^2 - 8v + 8$

11. $(r^2 - 10r - 3) - (-r^2 - r + 1)$

12. $(7k^2 + k + 8) - (2k^2 - 3k - 3)$

13. $(a^2 - 9) - (a - 4)$

14. $(4x^2 + 11x - 7) - (x^2 - 3x - 6)$

15. $(k^2 - 3k) - (2k^2 - 7k - 1)$

16. $(5a^2 + ab) - (ab + 3b^2)$

17. $(5u^2 - 7) - (3u^2 - 4u + 6)$

18. $(4m^2 + mn) - (3mn + n^2)$

19. $(h^2 + 3h - 6) - (h^2 - 2h - 3)$

20. $(x^2 - x - 1) - (2x + 9x^2)$

21. $(6g^2 + 3g + 3) - (g^2 + g - 5)$

22. $(b^2 + b + 1) - (b^2 - b - 1)$

23. $(a^2 - 9a - 10) - (a^2 - a - 4)$

24. $(4r^2 + 7r) - (3r^2 - 2r + 7)$

NAME _____ DATE _____ PERIOD _____

13-3 Practice

Subtracting Polynomials

Find each difference.

1. $4y + 1$
$(-)\ 3y + 8$

2. $2k + 3$
$(-)\ 7k - 6$

3. $5j^2 + 2j - 2$
$(-)\ j^2 + 9j + 2$

4. $c^2 + 5c - 3$
$(-)\ -c^2 - 5c - 1$

5. $d^2 - 4d + 6$
$(-)\ d^2 + 3d - 8$

6. $2n^2 - 3n - 10$
$(-)\ -n^2 - 3n + 8$

7. $9m^2 - 4m + 13$
$(-)\ 7m^2 - 2m - 3$

8. $d^2 + 3d - 6$
$(-)\ d^2 + 3d + 6$

9. $-6q^2 - 3q + 2$
$(-)\ 3q^2 + 4q + 4$

10. $v^2 - v$
$(-)\ 2v^2 - 9v - 3$

11. $(4n^2 - n - 6) - (-2n^2 - 3n - 14)$

12. $(3k^2 + 9k) - (8k^2 - 12)$

13. $(k^2 - 7) - (k - 11)$

14. $(9x^2 - x - 2) - (3x^2 - x - 4)$

15. $(k^2 - 12) - (k^2 + 6k - 9)$

16. $(k^2 + 4kb) - (5kb + 2b^2)$

17. $(3u^2 - 9) - (u^2 + 21u + 2)$

18. $(5m^2 - 4mn) - (4mn + 8n^2)$

19. $(h^2 + 8h + 5) - (h^2 - 3h - 7)$

20. $(2x^2 - 4x - 8) - (2x - 8x^2)$

21. $(6g^2 + 3g + 2) - (g^2 + g - 4)$

22. $(b^3 + b^2 - ab) - (b^3 + 3b^2 + 5)$

23. POOLS A swimming pool is $(4w^2 - 16)$ feet long and $(w - 16)$ feet wide. How much longer is the length than the width?

Lesson 13-3

NAME _____ DATE _____ PERIOD _____

13-3

Reading to Learn Mathematics

Subtracting Polynomials

Pre-Activity

How is subtracting polynomials similar to subtracting measurements?

Do the activity at the top of page 678 in your textbook. Write your answers below.

a. What is the difference in degrees and the difference in minutes between the two stations?

b. Explain how you can find the difference in latitude between any two locations, given the degrees and minutes.

c. The longitude of Station 1 is 162°16′36″ and the longitude of Station 5 is 68°8′2″. Find the difference in longitude between the two stations.

Reading the Lesson

1. Show how to find the difference $(3x^2 + x + 2) - (2x^2 - 7)$ by aligning like terms and by adding the additive inverse.

Like Terms **Additive Inverse**

2. Which method do you prefer? Why?

Helping You Remember

3. a. You have learned to subtract polynomials by adding the additive inverse. Look up *inverse* in the dictionary. What is its definition? How does this help you remember how to find the additive inverse?

b. Write the additive inverses of the polynomials in the table below.

Polynomial	Additive Inverse
$x^2 + 2x - 3$	
$6x - 8$	
$5x^2 + 8y^2 - 2xy$	

NAME _____ DATE _____ PERIOD _____

13-3 Enrichment

Polynomials with Fractional Coefficients

Polynomials may have fractional coefficients in some or all of the terms. Computation with these types of polynomials is done in the same way as with whole-number coefficients.

Add or subtract. Write all coefficients as fractions.

1. Add $\frac{3}{4}x^2 + \frac{2}{5}y^2$ and $\frac{1}{6}x^2 - \frac{4}{3}y^2$.

2. From $\frac{1}{2}x^2 - \frac{1}{3}xy^2 + \frac{1}{4}y^2$, take $\frac{1}{3}x^2 - \frac{1}{2}xy + \frac{5}{6}y^2$.

3. Add $\frac{3}{2}x - \frac{4}{3}y$, $-\frac{7}{8}x - \frac{6}{7}y$, and $y - \frac{1}{4}x$.

4. Subtract $\frac{1}{6}x^2 + \frac{1}{8}x - \frac{1}{4}$ from $\frac{2}{3}x^2 + \frac{5}{8}x + \frac{1}{2}$.

5. Add $\frac{1}{3}xy + \frac{11}{12}y^2$ to $\frac{4}{9}xy - \frac{1}{6}y^2$.

6. Add $\frac{1}{5}x^2 - \frac{1}{8}x - \frac{1}{3}$ and $\frac{3}{10}x^2 + \frac{5}{8}x + \frac{1}{9}$.

7. From $\frac{1}{2} + \frac{2}{3}y + \frac{3}{4}y^2$, take $\frac{1}{8} + \frac{1}{6}y - \frac{5}{6}y^2$.

8. Subtract $\frac{7}{12}x - \frac{1}{4}$ from $\frac{3}{4}x - \frac{1}{3}$.

9. Add $\frac{3}{8}x^2 - \frac{1}{3}xy + \frac{5}{9}y^2$ and $\frac{1}{2}x^2 - \frac{1}{2}xy - \frac{1}{3}y^2$.

10. Subtract $\frac{3}{4}y^2 + \frac{1}{2}y$ from $\frac{4}{3}y^2 + \frac{7}{8}y$.

Lesson 13-3

NAME _____ DATE _____ PERIOD _____

13-4 Study Guide and Intervention

Multiplying a Polynomial by a Monomial

The Distributive Property can be used to multiply a polynomial by a monomial.

Example 1 **Find $7(4x - 8)$.**

$$\begin{aligned} 7(4x - 8) &= 7(4x) - 7(8) \\ &= 28x - 56 \end{aligned}$$

Example 2 **Find $(x^2 - 5x + 4)(-2x)$.**

$$\begin{aligned} (x^2 - 5x + 4)(-2x) &= x^2(-2x) - 5x(-2x) + 4(-2x) \\ &= -2x^3 + 10x^2 - 8x \end{aligned}$$

Exercises

Find each product.

1. $5(7y + 4)$

2. $(3h + 6)4$

3. $-9(q + 8)$

4. $6(d - 2)$

5. $(4g - 5)(-2)$

6. $-7(4x^2 - 7)$

7. $-2(n^2 - 3n + 9)$

8. $(a^2 - 2ab + b^2)5$

9. $r(r + 9)$

10. $(b^2 - 4)(-b)$

11. $-x(3x + 6)$

12. $(2k - 9)(k^2)$

13. $-m(6m + 1)$

14. $p(7p - 2)$

15. $(8 - 3h)(-h)$

16. $w(4w^2 - 2w + 3)$

17. $ab(2a + b)$

18. $x(7x + y)$

19. $(m^2 - mn - n)m$

20. $2y(5y + 1)$

21. $-10u(u - 5)$

22. $(5r^2 - 2r)(-3r)$

23. $8z(2z + 7)$

24. $5b^2(6b - 2)$

25. $4p^2(6p^2 + 3p)$

26. $(5v^2 - 2v - 4)(-2v)$

27. $8y^3(3y^2 - y + 8)$

28. $3m(2m + 4n)$

29. $(8gh - 3h)(-3gh)$

30. $5a(2a - 3ab + b)$

NAME _____ DATE _____ PERIOD _____

13-4 Skills Practice

Multiplying a Polynomial by a Monomial

Find each product.

1. $4(k + 7)$

2. $(5h + 3)3$

3. $-9(2q + 7)$

4. $(6v - 1)(-6)$

5. $-8(5h - 6)$

6. $3(12y - 6)$

7. $(9d + 3)4$

8. $-5(5n - 9)$

9. $2(x^2 + 4)$

10. $-6(5x^2 - 3x)$

11. $(4x^2 - 6x - 9)9$

12. $-7(2c^2 - 8c + 5)$

13. $g(2g + 5)$

14. $-b(9b - 6)$

15. $(4y + 7)y$

16. $(2j - 1)(-j)$

17. $-c(c - 2)$

18. $h(6h + 4)$

19. $(6k + 6)(-k)$

20. $p(3p - 8)$

21. $-a(8a + 2)$

22. $r(r^2 + 7r)$

23. $x(4x^2 - 2x - 1)$

24. $ab(3ab + 2a)$

25. $x(4xy - 3y^2)$

26. $(gh - h)(-g)$

27. $x(4x^2 - xy + y^2)$

28. $6v(3v + 9)$

29. $(u + 4)(-5u)$

30. $8b(b - 6)$

31. $-7d(5d - 9)$

32. $(8w - 4)w$

33. $a(7a + 4)$

34. $(6y - 6)(-y^2)$

35. $s(s + 1)$

36. $-m(6m - 7)$

37. $-k^2(2k - 3)$

38. $c(7c^2 + 3c - 4)$

39. $7mn(m + 2mn + 4n)$

40. $8a(a + ab + b)$

41. $(xy - y^2)(-4xy)$

42. $-8u(7u^2 - 2uv + 4v^2)$

Lesson 13-4

NAME _____ DATE _____ PERIOD _____

13-4 Practice

Multiplying a Polynomial by a Monomial

Find each product.

1. $5(3k + 8)$

2. $(3h + 6)2$

3. $-2(q - 4)$

4. $(3v - 5)(-7)$

5. $11(4d - 7)$

6. $-8(12c - 6)$

7. $(5g - 10)(-5)$

8. $2(5p - 10)$

9. $-9(3f^2 - 2f - 1)$

10. $2.5(8w + 5)$

11. $(4r^3 - 3r)(–8)$

12. $-6(3x^2 - 2x + 7)$

13. $n(7n + 3)$

14. $(6u - 15)(-u)$

15. $-h(8h + 2)$

16. $(8y + 3)(-y)$

17. $a(4a - 4)$

18. $(5p + 15)(-p)$

19. $-d(-5d + 1)$

20. $-g(1.8g + 10)$

21. $m(0.9m^2 - 0.5)$

22. $(2q^3 - 5q^2 - 2q)(–q)$

23. $k^3(7k^4 - 2k^2 + 6)$

24. $ab(10a^2b + 3a)$

25. $y^2(5x - 2xy + y)$

26. $n(8 - m - 12mn^2)$

27. $(4gh^2 - 2g^2 - h)(-g^2)$

28. $(20q - 4)(-2q)$

29. $14k(2k + 5)$

30. $(9p - 7)(-3p^2)$

31. $(0.2c - 1)(-1.5c^2)$

32. $-6.5n(4n^2 - 8)$

33. $-6x^2(4x^2 - 10x)$

34. $5h^2(2h^3 - h^2 - 7h + 8)$

35. $(4y^2 - 3y + 9)(-2y)$

36. $6gh(8g^2 + 4gh + 3h^2)$

37. $10a(2a^2 - 5ab + 4a)$

38. $(8x^2 - 3xy - xy^2)(-7x)$

39. $-5c^2(2cd - d^2 + 1)$

40. Find the area of a porch that is $3x$ feet wide and $4x + 9$ feet long.

NAME _____ DATE _____ PERIOD _____

13-4

Reading to Learn Mathematics

Multiplying a Polynomial by a Monomial

Pre-Activity

How is the Distributive Property used to multiply a polynomial by a monomial?

Do the activity at the top of page 683 in your textbook. Write your answers below.

a. Write an expression that represents the area of the rectangular region outlined on the photo.

b. Recall that $2(4 + 1) = 2(4) + 2(1)$ by the Distributive Property. Use this property to simplify the expression you wrote in part **a**.

c. The Grande Arche is approximately w feet deep. Explain how you can write a polynomial to represent the volume of the hollowed-out region of the building. Then write the polynomial.

Reading the Lesson

1. Draw a model that shows the product $x(x + 2)$. Write the polynomial that shows the product.

2. Explain the Distributive Property and give an example of how it is used to multiply a polynomial by a monomial.

Helping You Remember

3. *Distribute* is a common word in the English language.

a. Find the definition of *distribute* in a dictionary. Write the definition that most closely relates to this lesson.

b. Explain how this definition can help you remember how to use the Distributive Property to multiply a polynomial by a monomial.

Lesson 13-4

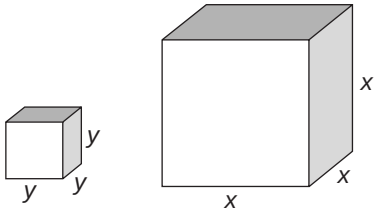
NAME _____ DATE _____ PERIOD _____

13-4 Enrichment

Polynomials and Volume

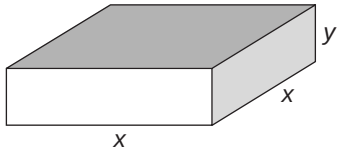
The volume of a rectangular prism can be written as the product of three polynomials. Recall that the volume equals the length times the width times the height.

The two prisms at the right represent the cube of y and the cube of x.



Multiply to find the volume of each prism. Write each answer as an algebraic expression.

1.



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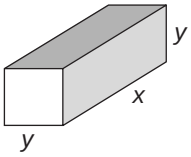

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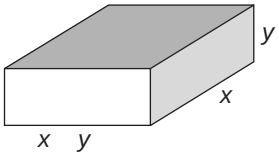

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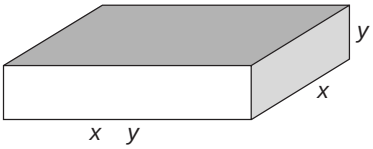

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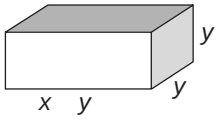

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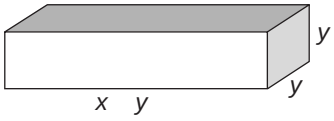
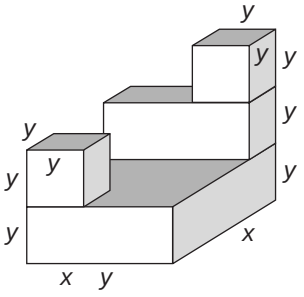


Multiply, then add to find each volume. Write each answer as an algebraic expression.

7.



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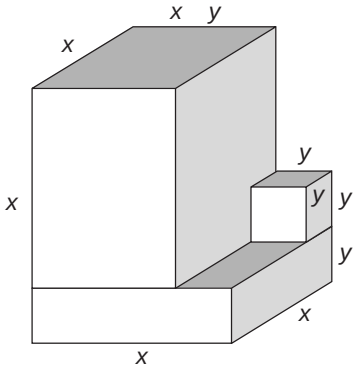

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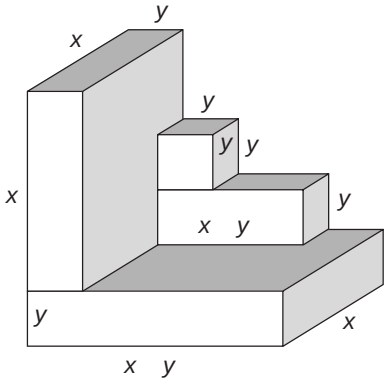


NAME _____ DATE _____ PERIOD _____

13-5 Study Guide and Intervention

Linear and Nonlinear Functions

Linear functions have constant rates of change. Their graphs are straight lines and their equations can be written in the form $y = mx + b$. Nonlinear functions do not have constant rates of change and their graphs are not straight lines.

Example 1 **Determine whether each equation represents a *linear* or *nonlinear* function.**

a. $y = 9$

This is linear because it can be written as $y = 0x + 9$.

b. $y = x^2 + 4$

This is nonlinear because the exponent of x is not 1, so the equation cannot be written in the form $y = mx + b$.

Tables can represent functions. A nonlinear function does not increase or decrease at a constant rate.

Example 2 **Determine whether each table represents a *linear* or *nonlinear* function.**

a.

	x	y	
	0	−7	
+ 2	2	1	+ 8
+ 2	4	9	+ 8
+ 2	6	17	+ 8

As x increases by 2, y increases by 8. The rate of change is constant, so this is a linear function.

b.

	x	y	
	0	100	
+ 5	5	75	− 25
+ 5	10	0	− 75
+ 5	15	−125	− 125

As x increases by 5, y decreases by a greater amount each time. The rate of change is not constant, so this is a nonlinear function.

Exercises

Determine whether each equation or table represents a *linear* or *nonlinear* function. Explain.

1. $x + 3y = 9$

2. $y = \frac{8}{x}$

3. $y = 6x(x + 1)$

4. $y = 9 - 5x$

5.

x	y
0	24
2	14
4	4
6	−6

6.

x	y
1	1
2	8
3	27
4	64

Lesson 13-5

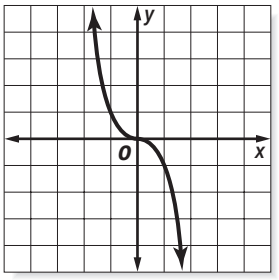
NAME _____ DATE _____ PERIOD _____

13-5 Skills Practice

Linear and Nonlinear Functions

Determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.

1.



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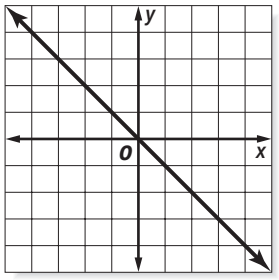
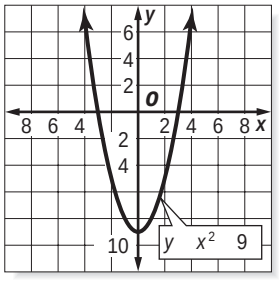


3.



4. $y = \frac{x}{2} + 1$

5. $y = \frac{2}{x} + 10$

6. $y = 8x$

7. $y = 6$

8. $2x - y = 5$

9. $y = x^2 + 4$

10. $y + 4x^2 - 1 = 0$

11. $2y - 8x + 11 = 0$

12. $y = \sqrt{3x} - 2$

13.

x	y
1	8
2	5
3	2
4	−1

14.

x	y
6	1
12	3
18	6
24	10

15.

x	y
20	−4
15	−2
10	0
5	2

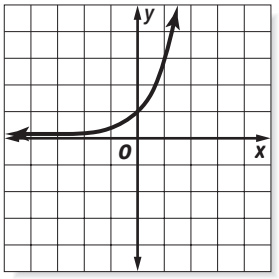
NAME _____ DATE _____ PERIOD _____

13-5 Practice

Linear and Nonlinear Functions

Determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.

1.



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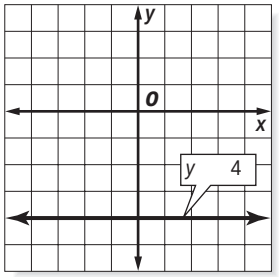
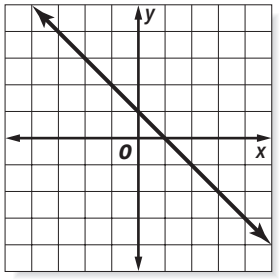


3.



4. $5x - y = 15$

5. $3y + 12x^2 = 0$

6. $5y - x + 3 = 0$

7. $y = 6\sqrt{x} + 10$

8. $y = \frac{8}{x}$

9. $y = -x^2 + 2$

10.

x	y
1	1.0
2	0.8
3	0.6
4	0.4

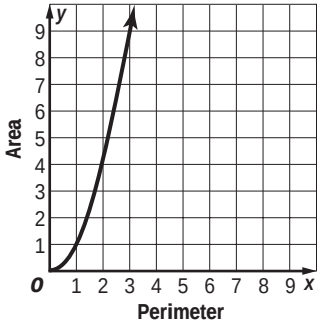
11.

x	y
44	0
48	2.5
52	5.0
56	7.5

12.

x	y
3	1
6	−2
9	−5
12	−14

13. GEOMETRY The graph shows how the area of a square increases as the perimeter increases. Is this relationship linear or nonlinear? Explain.



Lesson 13-5

NAME _____ DATE _____ PERIOD _____

13-5 Reading to Learn Mathematics

Linear and Nonlinear Functions

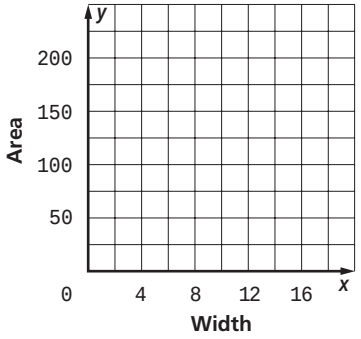
Pre-Activity *How can you determine whether a function is linear?*

Do the activity at the top of page 687 in your textbook. Write your answers below.

a. Write an expression to represent the area of the deck.

b. Find the area of the deck for widths of 6, 8, 10, 12, and 14 feet.

c. Graph the points whose ordered pairs are (width, area). Do the points fall along a straight line? Explain.



Reading the Lesson

Write a definition and give an example of each new vocabulary phrase.

Vocabulary	Definition	Example
1. nonlinear function		
2. quadratic function		
3. cubic function		

Helping You Remember

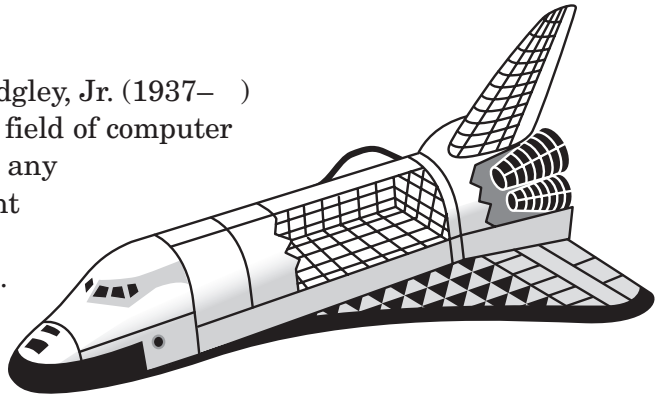
4. You have learned about linear and nonlinear functions. Nonlinear functions include quadratic functions and cubic functions. Below, write three equations that represent each type of function given. For the nonlinear functions, include at least one quadratic function and one cubic function.

Linear	Nonlinear
1.	**1.**
2.	**2.**
3.	**3.**

NAME _____ DATE _____ PERIOD _____

13-5 Enrichment

David R. Hedgley



African-American mathematician David R. Hedgley, Jr. (1937–) solved one of the most difficult problems in the field of computer graphics—how to program a computer to show any three-dimensional object from a given viewpoint just as the eye would see it. Hedgley's solution helped researchers in aircraft experimentation. Hedgley received an M.S. in Mathematics from California State University in 1970 and a Ph.D. in Computer Science from Somerset University in England in 1988. Hedgley has received numerous national achievement awards.

Polynomials in three variables are needed to describe some three-dimensional objects. Each variable represents one of the three dimensions: height, width, and depth.

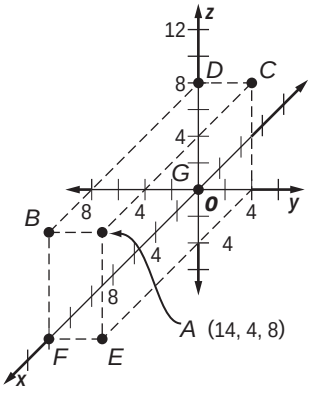
P_1: $x^2 + y^2 + z^2 + 10x + 4y + 2z - 19$

P_2: $2x^2 + 2y^2 + 2z^2 - 2x - 3y + 5z - 2$

1. Add the polynomials P_1 and P_2.

2. Subtract the polynomials, P_1 from P_2.

If the polynomials above were each set equal to zero, they would form equations describing two different spheres in three-dimensional space, or *3-space*. The coordinate plane you studied in Chapter 2 represents *two-space*. You described most lines in that plane by an equation in two variables. Each point on a line could be written as an ordered pair of numbers (x, y). Each point on any figure in 3-space can be written as an *ordered triple* of numbers (x, y, z).



3. What are the values of x, y, and z for point A in the diagram?

4. Give the ordered triple representing each of the points B through G in the diagram.

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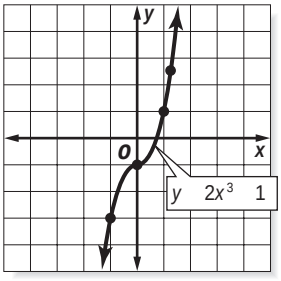
13-6 Study Guide and Intervention

Graphing Quadratic and Cubic Functions

To graph a quadratic or cubic function, make a table of values and then plot the points.

Example **Graph $y = 2x^3 - 1$.**

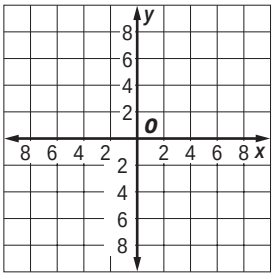
x	y
−1	–3
0	–1
1	1
1.2	2.5



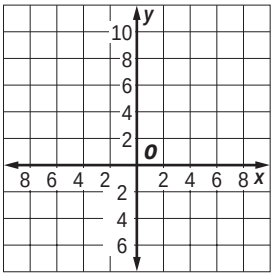
Exercises

Graph each function.

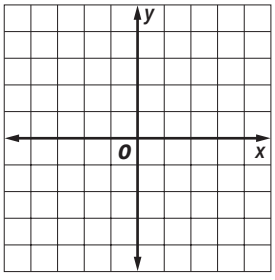
1. $y = x^2 + 2$



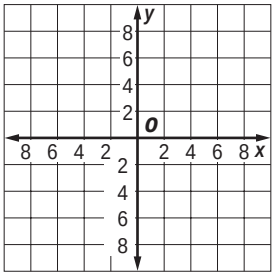
2. $y = x^3 + 2$



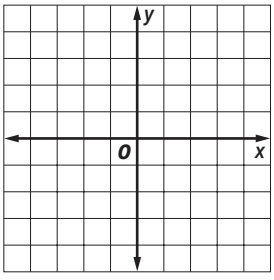
3. $y = -x^2 + 2$



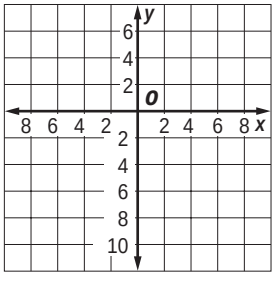
4. $y = -x^3 + 2$



5. $y = x^2 - 2$



6. $y = x^3 - 2$



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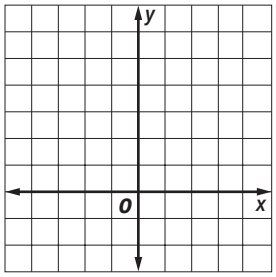
Skills Practice

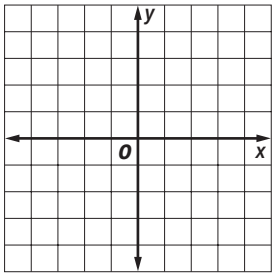
Graphing Quadratic and Cubic Functions

Graph each function.

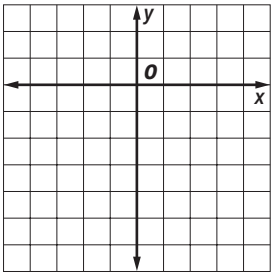
1. $y = 5x^2$



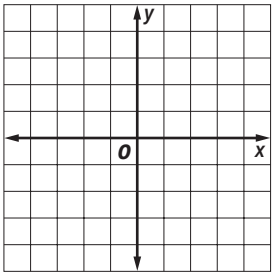
2. $y = 5x^3$



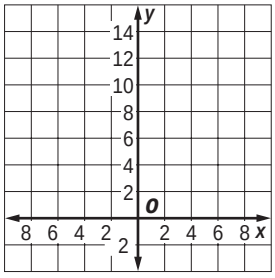
3. $y = -5x^2$



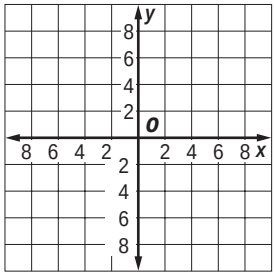
4. $y = -5x^3$



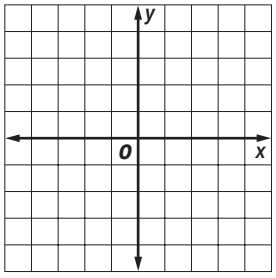
5. $y = x^2 + 4$



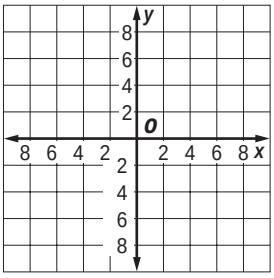
6. $y = x^3 + 4$



7. $y = x^2 - 4$



8. $y = x^3 - 4$



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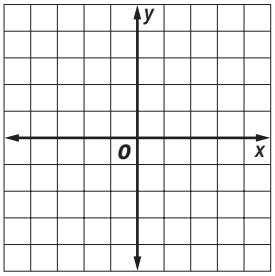
13-6 Practice

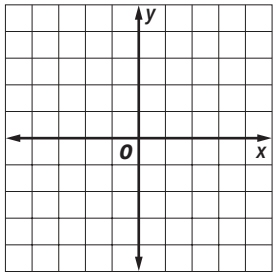
Graphing Quadratic and Cubic Functions

Graph each function.

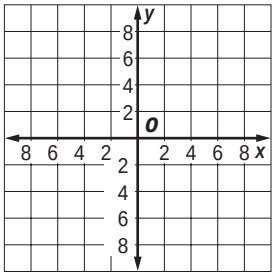
1. $y = 0.4x^2$



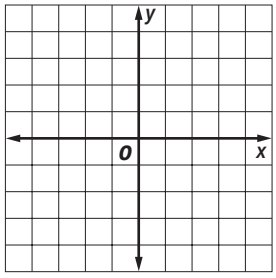
2. $y = 0.4x^3$



3. $y = -2x^2 - 1$



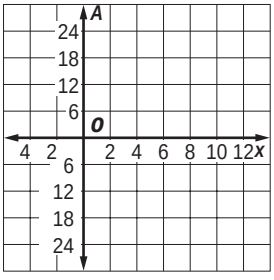
4. $y = -2x^3 - 1$



5. WINDOWS A window maker has 25 feet of wire to frame a window. One side of the window is x feet and the other side is $9 - x$ feet.

a. Write an equation to represent the area A of the window.

b. Graph the equation you wrote in part **a**.



c. If the area of the window is 18 square feet, what are the two possible values of x?

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Reading to Learn Mathematics

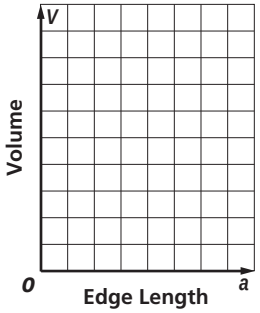
Graphing Quadratic and Cubic Functions

Pre-Activity *How are functions, formulas, tables, and graphs related?*

Do the activity at the top of page 692 in your textbook. Write your answers below.

a. The volume of cube V equals the cube of the length of an edge a. Write a formula to represent the volume of a cube as a function of edge length.

b. Graph the volume as a function of edge length. (*Hint*: Use values of a like 0, 0.5, 1, 1.5, 2, and so on.)



Reading the Lesson

1. Write a quadratic function. Explain what makes it a quadratic function and what its graph would look like.

2. Write a cubic function. Explain what makes it a cubic function and what its graph would look like.

Helping You Remember

3. You have learned to graph quadratic and cubic functions. Make a list of the steps you use to graph the two functions.

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Translating Quadratic Graphs

When a figure is moved to a new position without undergoing any rotation, then the figure is said to have been **translated** to the new position.

The graph of a quadratic equation in the form $y = (x - b)^2 + c$ is a translation of the graph of $y = x^2$.

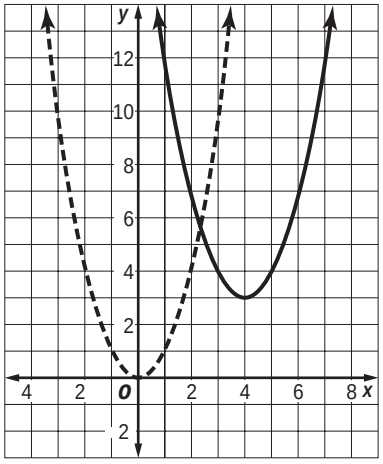
Start with a graph of $y = x^2$.

Slide to the right 4 units.

$$y = (x - 4)^2$$

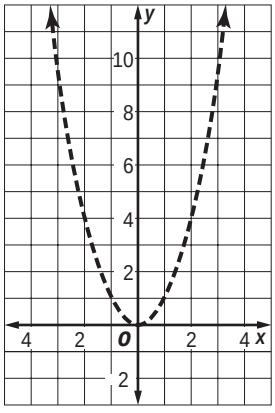
Then slide up 3 units.

$$y = (x - 4)^2 + 3$$

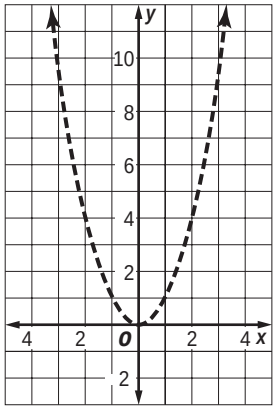


The following equations are in the form $y = x^2 + c$. Graph each equation.

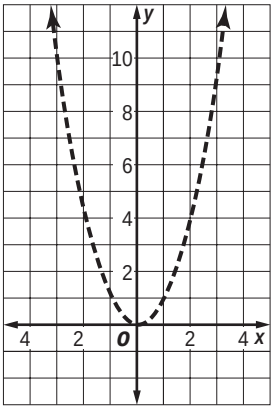
1. $y = x^2 + 1$



2. $y = x^2 + 2$

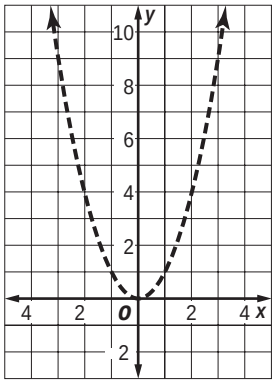


3. $y = x^2 - 2$

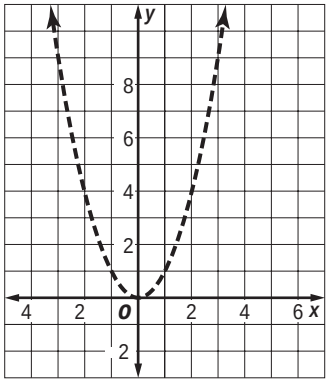


The following equations are in the form $y = (x - b)^2$. Graph each equation.

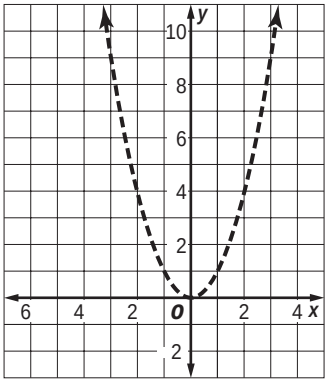
4. $y = (x - 1)^2$



5. $y = (x - 3)^2$



6. $y = (x + 2)^2$



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Chapter 13 Test, Form 1

SCORE _____

Write the letter for the correct answer in the blank at the right of each question.

1. Choose the expression that is *not* a polynomial.

A. $6y - \frac{4}{y}$ **B.** $\frac{4x}{9} + \frac{2y}{5}$ **C.** $5x^2y + 7x$ **D.** $5a + 6b$ **1.** _____

2. The expression $x^2 + 2x$ is a

A. monomial. **B.** binomial. **C.** trinomial. **D.** constant. **2.** _____

3. Find the degree of $5bc$.

A. 0 **B.** 1 **C.** 2 **D.** 3 **3.** _____

4. Find the degree of $yx^3 + xy$.

A. 2 **B.** 3 **C.** 4 **D.** 6 **4.** _____

Find each sum.

5. $(9f + 4) + (f + 2)$

A. $10f - 6$ **B.** $10f + 6$ **C.** $8f + 2$ **D.** $9f^2 + 6f$ **5.** _____

6. $(2x + 2) + (x - 6)$

A. $4x^2 - 12$ **B.** $x + 8$ **C.** $3x - 4$ **D.** $x - 8$ **6.** _____

7. $(5a + 3b) + (6a + 2b)$

A. $11a + 5b$ **B.** $-a + b$ **C.** $11a - 5b$ **D.** $a - b$ **7.** _____

8. $(3x^2 + y) + (5x^2 - 1 + y)$

A. $-2x^2 + 3y$ **B.** $8x^2 + y$ **C.** $-2x^2 - 3y$ **D.** $8x^2 + 2y - 1$ **8.** _____

Find each difference.

9. $(6m + 4) - (3m + 1)$

A. $9m + 5$ **B.** $3m + 3$ **C.** $3m + 5m$ **D.** $3m - 5$ **9.** _____

10. $(7x - 5) - (2x - 1)$

A. $5x + 4$ **B.** $9x - 4$ **C.** $5x - 4$ **D.** $5x - 4x$ **10.** _____

11. $(3a + 7b) - (a + b)$

A. $2a + 6b$ **B.** $4a + 8b$ **C.** $2a - 6b$ **D.** $4a - 8b$ **11.** _____

12. $(4x^2 - x + 1) - (3x^2 - 2x - 8)$

A. $7x^2 - 3x + 7$ **B.** $x^2 - 3x - 7$ **C.** $7x^2 + 3x - 9$ **D.** $x^2 + x + 9$ **12.** _____

Assessment

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Chapter 13 Test, Form 1 *(continued)*

Find each product.

13. $4(3y + 5)$

A. $7y - 9$ **B.** $7y + 9$ **C.** $12y + 20$ **D.** $12y + 20y$ **13.** _____

14. $b(b - 3)$

A. $-b$ **B.** $b^2 - 3b$ **C.** $2b - 3b$ **D.** $b^2 + 3b$ **14.** _____

15. $3t(t + 7)$

A. $3t^2 + 21t$ **B.** $3t^2 - 21t^2$ **C.** $-18t^2$ **D.** $14t$ **15.** _____

16. $(6x + y)x$

A. $7x + xy$ **B.** $6x^2 + x + y$ **C.** $7x - xy$ **D.** $6x^2 + xy$ **16.** _____

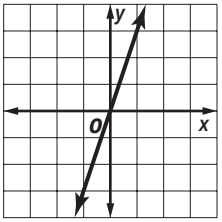
17. Which equation describes a nonlinear function?

A. $x = \frac{y}{4}$ **B.** $x = 3x + 7$ **C.** $y = x^2y$ **D.** $y = 5(x - 1)$ **17.** _____

18. Which type of function does the graph shown at the right represent?

A. linear **B.** nonlinear

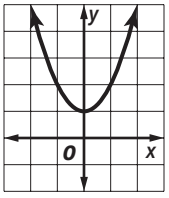
C. cubic **D.** quadratic



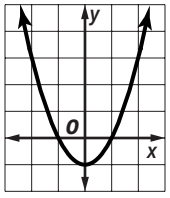
18. _____

19. Choose the graph that represents $y = x^3 + 1$.

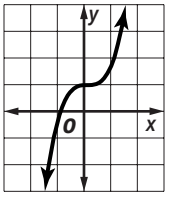
A.



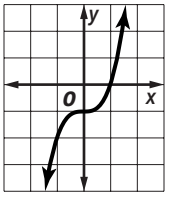
B.



C.



D.

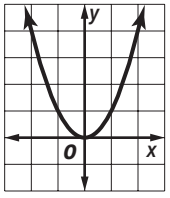


19. _____

20. Choose the equation that represents the graph at the right.

A. $y = -x^2$ **B.** $y = x^2$

C. $y = x^3$ **D.** $y = -x^3$



20. _____

Bonus **GEOMETRY** A rectangle has sides of length $3x - 4$ and width $x - y$. Find the perimeter. **B:** _____

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Chapter 13 Test, Form 2A

SCORE _____

Assessment

Write the letter for the correct answer in the blank at the right of each question.

1. Choose the expression that is *not* a polynomial.

A. $\frac{4}{9}$ **B.** $5x^2y^3 + 7x^3y^2$ **C.** $\sqrt{a - 2b}$ **D.** $6x + \frac{y}{8}$ **1.** _____

2. Find the degree of $7ab^3c^5$.

A. 9 **B.** 8 **C.** 16 **D.** 7 **2.** _____

3. The expression $\frac{2}{3}x + \frac{1}{2}y - z$ is a

A. monomial. **B.** binomial. **C.** trinomial. **D.** constant. **3.** _____

4. Find the degree of $x^3 + x^2y^3 + y^4$.

A. 5 **B.** 4 **C.** 3 **D.** 12 **4.** _____

Find each sum or difference.

5. $(9x + 2) + (6x + 4)$

A. $3x - 2$ **B.** $15x + 6$ **C.** $15x - 6$ **D.** $3x + 2$ **5.** _____

6. $(5x - 7y + 4) - (2x + y - 3)$

A. $7x - 7y + 7$ **B.** $7x + 8y - 7$ **C.** $3x - 8y + 7$ **D.** $3x - 6y - 1$ **6.** _____

7. $(6a^2 + b^2) + (-3a + b^2)$

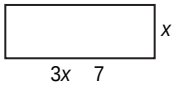
A. $6a^2 - 3a + 2b^2$ **B.** $3a^2 + 2b^2$

C. $9a^2 - 3a$ **D.** $9a^3 + 2b^2$ **7.** _____

8. $(7t^2 - 4s^2) - (2t^2 + 10s^2)$

A. $9t^2 + 6s^2$ **B.** $9t^2 - 6s^2$ **C.** $5t^2 + 14s^2$ **D.** $5t^2 - 14s^2$ **8.** _____

For Questions 9 and 10, refer to the rectangle.



9. Find the perimeter of the rectangle.

A. $4x^2 + 7$ **B.** $8x - 14$

C. $4x - 7$ **D.** $3x^2 - 7$ **9.** _____

10. If the perimeter of the rectangle is 34 centimeters, what is the value of x?

A. 5 **B.** 6 **C.** 7 **D.** 8 **10.** _____

11. GEOMETRY Franklin plans to trim a piece of carpet to fit a space with an area of $2x^2 + 3x + 4$. The area of the carpet is $2x^2 + 9x + 11$. How much of the carpet will Franklin have to trim so that it will fit into the space?

A. $4x^2 + 12x + 15$ **B.** $-6x + 7$

C. $12x + 15$ **D.** $6x + 7$ **11.** _____

NAME _____ DATE _____ PERIOD _____

13

Chapter 13 Test, Form 2A *(continued)*

For Questions 12–15, find each product.

12. $7(3 + 4b)$

A. $10 - 28b$ **B.** $21 + 28b$ **C.** $10 + 11b$ **D.** $49b$ **12.** _____

13. $t(5t - 3)$

A. $5t^2 + 3t$ **B.** $5t - 3t$ **C.** $5t^2 - 3t$ **D.** $5t + 3t$ **13.** _____

14. $-2(4x^2 - 8x)$

A. $-8x^2 + 16x$ **B.** $8x^2 - 16x$ **C.** $-6x^2 - 10x$ **D.** $6x^2 + 10x$ **14.** _____

15. $(x + 4y)3x$

A. $3x + 12xy$ **B.** $3x + 12y$ **C.** $3x^2 + 7xy$ **D.** $3x^2 + 12xy$ **15.** _____

16. SPORTS The perimeter of a singles tennis court is 210 feet. The length is equal to 2 times the width plus 24. Find the width.

A. 62 ft **B.** 27 ft **C.** 43 ft **D.** 78 ft **16.** _____

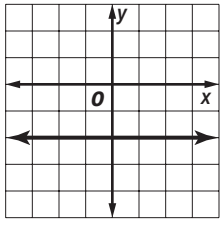
17. Which equation describes a nonlinear function?

A. $y = 1.3x$ **B.** $y = \frac{4x}{7}$ **C.** $y = x^3 - 5$ **D.** $12 = 3x + 4y$ **17.** _____

18. The graph shown at the right represents a function that is

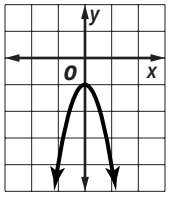
A. linear. **B.** nonlinear.

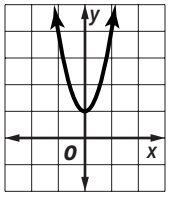
C. cubic. **D.** quadratic.

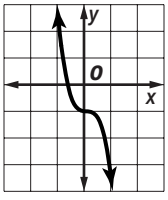


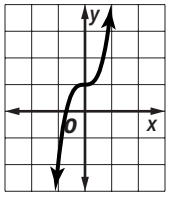
18. _____

19. Choose the graph that represents $y = 3x^3 + 1$.

A.


B.


C.


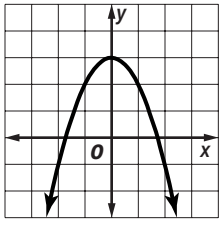
D.


19. _____

20. Choose the equation that represents the graph shown at the right.

A. $x^3 - 3$ **B.** $-x^3 - 3$

C. $x^2 + 3$ **D.** $-x^2 + 3$



20. _____

Bonus Write a binomial with degree 4. **B:** _____

NAME _____ DATE _____ PERIOD _____

13

Chapter 13 Test, Form 2B

SCORE _____

Write the letter for the correct answer in the blank at the right of each question.

1. Choose the expression that is *not* a polynomial.

A. $\frac{4}{5}$ **B.** $\frac{4}{x}$ **C.** $3x^2y - 7xy^2$ **D.** $12x - \frac{y}{7}$ **1.** _____

2. Find the degree of $3ab^6$.

A. 18 **B.** 8 **C.** 6 **D.** 7 **2.** _____

3. The expression $x^2 + 2x + 4$ is a

A. monomial. **B.** binomial. **C.** trinomial. **D.** constant. **3.** _____

4. Find the degree of $x^2y + xy + 3y^2$.

A. 1 **B.** 2 **C.** 3 **D.** 4 **4.** _____

Find each sum or difference.

5. $(7x + 3) + (6x + 5)$

A. $x - 2$ **B.** $13x + 8$ **C.** $13x - 8$ **D.** $x + 2$ **5.** _____

6. $(-x^2 - 9x + 4) - (6x^2 + 5x + 1)$

A. $-7x^2 - 14x + 3$ **B.** $-5x^2 + 4x^2 + 5$

C. $-7x^2 - 4x + 5$ **D.** $-5x^2 + 4x^2 + 3$ **6.** _____

7. $(10a^2 + b^2) + (-4a + b^2)$

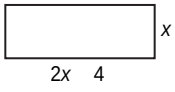
A. $14a^2 + 2b^2$ **B.** $10a^2 + 4a - 2b^2$

C. $6a^2 + 2b^2$ **D.** $10a^2 - 4a + 2b^2$ **7.** _____

8. $(8t^2 - 5s^2) - (2t^2 + 10s^2)$

A. $16t^2 - 15s^2$ **B.** $6t^2 - 15s^2$ **C.** $8t^2 - 2t - 15s^2$ **D.** $10t^2 + 5s^2$ **8.** _____

For Questions 9 and 10, refer to the rectangle.



9. Find the perimeter of the rectangle.

A. $2x^2 + 4x$ **B.** $3x + 4$

C. $6x + 8$ **D.** $2x^2 + 4$ **9.** _____

10. If the perimeter of the rectangle is 38 centimeters, what is the value of x?

A. 5 **B.** 6 **C.** 8 **D.** 19 **10.** _____

11. GEOMETRY Marcus plans to trim a piece of carpet to fit a space with an area of $2x^2 + 5x + 4$. The area of the carpet is $2x^2 + 8x + 10$. How much of the carpet will Marcus have to trim so that it will fit into the space?

A. $3x + 14$ **B.** $4x^2 + 13x + 14$

C. $3x + 6$ **D.** $3x - 6$ **11.** _____

NAME _____ DATE _____ PERIOD _____

13

Chapter 13 Test, Form 2B *(continued)*

For Questions 12–15, find each product.

12. $6(4 + 3b)$

A. $10 + 9b$ **B.** $24 + 18b$ **C.** $24b + 18b$ **D.** $10 - 9b$ **12.** _____

13. $t(8t - 2)$

A. $8t^2 + 2t$ **B.** $6t^2$ **C.** $8t^2 - 2t$ **D.** $8t^2 + 2t^2$ **13.** _____

14. $-3(2x^2 - 5x)$

A. $-6x^2 + 15x$ **B.** $6x^2 - 15x$ **C.** $-5x^2 + 8x$ **D.** $5x^2 - 8x$ **14.** _____

15. $(x + 3y)4x$

A. $5x^2 + 7xy$ **B.** $4x^2 + 12x$ **C.** $4x^2 + 12y$ **D.** $4x^2 + 12xy$ **15.** _____

16. SPORTS The perimeter of a doubles tennis court is 228 feet. The length is equal to 2 times the width plus 6. Find the width of a doubles tennis court.

A. 74 ft **B.** 36 ft **C.** 42 ft **D.** 78 ft **16.** _____

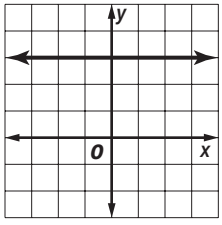
17. Which equation represents a nonlinear function?

A. $y = x^3 + 1$ **B.** $y = \frac{3x}{8}$ **C.** $15 = 2x + 3y$ **D.** $1.7x = y$ **17.** _____

18. The graph shown at the right represents a function that is

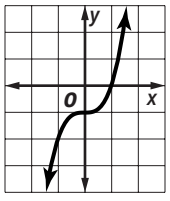
A. linear. **B.** nonlinear.

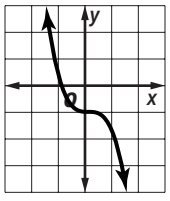
C. cubic. **D.** quadratic.

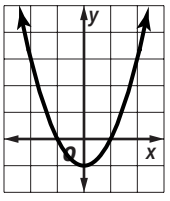


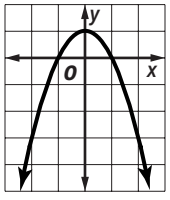
18. _____

19. Choose the graph that represents $y = x^2 - 1$.

A.


B.


C.


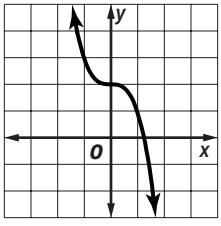
D.


19. _____

20. Choose the equation that represents the graph shown at the right.

A. $y = -x^2 - 2$ **B.** $y = x^2 + 2$

C. $y = -x^3 + 2$ **D.** $y = x^3 - 2$



20. _____

Bonus Write a trinomial with degree 5. **B:** _____

NAME _____ DATE _____ PERIOD _____

13

Chapter 13 Test, Form 2C

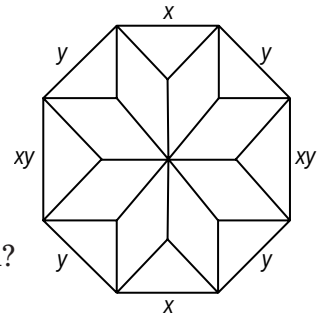
SCORE _____

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $3 + x + x^2$ **1.** _____

2. $\frac{x}{3}$ **2.** _____

ART For Questions 3 and 4, refer to the diagram of a stained glass window at the right.



3. Write a polynomial that represents the perimeter of the stained glass window. **3.** _____

4. What is the degree of the polynomial? **4.** _____

Find each sum or difference.

5. $(2x + 4) + (3x + 3)$ **5.** _____

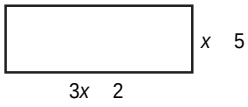
6. $(8y + 7) - (4y + 3)$ **6.** _____

7. $(5a^2 + b^2) + (-3a + b^2)$ **7.** _____

8. $(7t^2 - 5s^2) - (4t^2 + 10s^2)$ **8.** _____

9. $(6x^2 + 5x + 2) - (x^2 + 2x + 4)$ **9.** _____

GEOMETRY For Questions 10–12, refer to the rectangle at the right.



10. Find the perimeter of the rectangle. **10.** _____

11. If the perimeter of the rectangle is 46 centimeters, what is the value of x? **11.** _____

12. Find the dimensions of the rectangle. **12.** _____

For Questions 13–18, find each product.

13. $3(4x + 1)$ **13.** _____

14. $-b(5b + 2)$ **14.** _____

15. $(6 + 3y)y$ **15.** _____

16. $(9 + 3a)4a$ **16.** _____

17. $-4c(4c - 1)$ **17.** _____

18. $km(k^2 - 2)$ **18.** _____

13 Chapter 13 Test, Form 2C *(continued)*

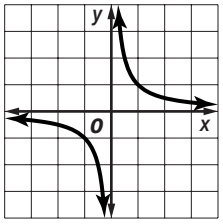
19. SPORTS The dimensions of a singles badminton court are different from the dimensions of a singles tennis court, as shown in the table. Use the information in the table to find the length and width of each court.

Measure (feet)	Tennis	Badminton
Perimeter	210	122
Width	x	y
Length	$2(x + 12)$	$2(y + 5)$

19. _____

Determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.

20.



21.

x	y
3	40
7	30
11	20
15	10

22. $ab = 12$

20. _____

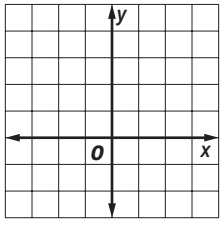
21. _____

22. _____

For Questions 23 and 24, graph each function.

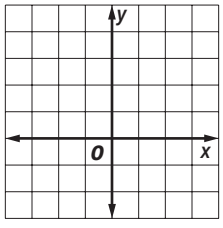
23. $y = 3x^2$

23.



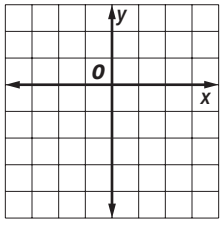
24. $y = x^3 + 2$

24.



25. Graph $y = x^3 - 3$ and $y = 3x^3$. Are these equations functions? Explain.

25.



_____

Bonus Find two polynomials whose difference is $2x^2 + x + 4$. **B:** _____

NAME _____ DATE _____ PERIOD _____

13 **Chapter 13 Test, Form 2D**

SCORE _____

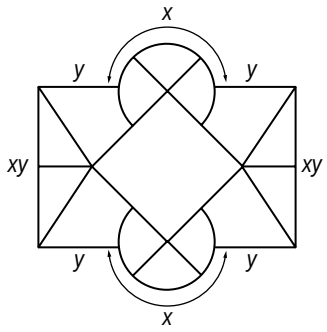
Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $\frac{3}{x}$ **2.** $x^2 + x + 2$

1. _____

2. _____

ART For Questions 3 and 4, refer to the diagram of a stained glass window at the right.



3. Write a polynomial that represents the perimeter of the stained glass window.

3. _____

4. What is the degree of the polynomial?

4. _____

Find each sum or difference.

5. $(3x + 2) + (5x + 3)$ 5. _____

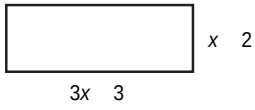
6. $(9y + 7) - (4y + 3)$ 6. _____

7. $(4a^2 + b^2) + (-2a + b^2)$ 7. _____

8. $(6t^2 - 7s^2) - (3t^2 + 10s^2)$ 8. _____

9. $(5x^2 + 7x + 3) - (2x^2 + x + 7)$ 9. _____

GEOMETRY For Questions 10–12, refer to the rectangle at the right.



10. Find the perimeter of the rectangle. 10. _____

11. If the perimeter of the rectangle is 38 centimeters, what is the value of x? 11. _____

12. Find the dimensions of the rectangle. 12. _____

For Questions 13–18, find each product.

13. $4(5x - 2)$ 13. _____

14. $-b(6b + 1)$ 14. _____

15. $(7 + 2y)y$ 15. _____

16. $(7 + 2a)5a$ 16. _____

17. $-3c(5c - 2)$ 17. _____

18. $km(k^3 + 4)$ 18. _____

Assessment

NAME _____ DATE _____ PERIOD _____

13

Chapter 13 Test, Form 2D *(continued)*

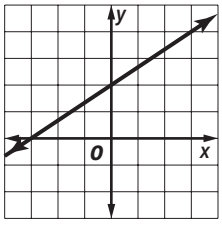
19. SPORTS The perimeter of a singles tennis court is different from the perimeter of a doubles tennis court, as shown in the table. Use the information in the table to find the length and width of each court.

Measure (feet)	Singles	Doubles
Perimeter	210	228
Width	y	x
Length	$2(y + 12)$	$2(x + 3)$

19. _____

Determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.

20.



21.

x	y
11	1
9	2
6	3
4	4

22. $y = \frac{x}{4}$

20. _____

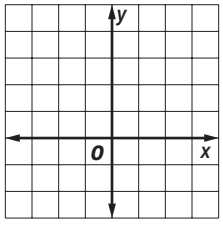
21. _____

22. _____

For Questions 23 and 24, graph each function.

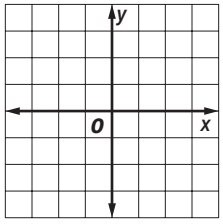
23. $y = 2x^2$

23.



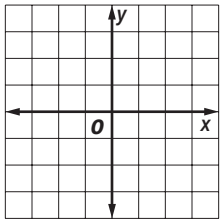
24. $x^3 - 1$

24.



25. Graph $y = x^2 - 1$ and $y = -x^2$. Are these equations functions? Explain.

25.



_____

Bonus GEOMETRY Find the area of a rectangle with width $4x$ cm and length $2x^2 - 9x + 4$ cm.

B: _____

NAME _____ DATE _____ PERIOD _____

13

Chapter 13 Test, Form 3

SCORE _____

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $\sqrt{3x^2 - 2y}$ 2. $7w^3 + \frac{1}{3}x^2 + \frac{1}{2}$

1. _____
2. _____

Tell whether each statement is *always*, *sometimes*, or *never* true. Explain.

3. A binomial has a degree of 2. 3. _____
4. A trinomial has 3 terms. 4. _____

Find each sum or difference.

5. $(7x + 3) + (4x - 5)$ 5. _____
6. $(7k - 6) - (2k - 4)$ 6. _____
7. $(3z^2 + 5zw + 3w^2) + (4z^2 - 2w^2)$ 7. _____
8. $(4x^2 - 5xy + 3y^2) - (2x^2 - 4xy + 5y^2)$ 8. _____
9. $(-6x^2 + x - 7) - (x^2 - 4x - 5)$ 9. _____

Find each sum. Then evaluate if $a = -2$, $b = 3$ and $c = 5$.

10. $(2b + 3a) + (4b - 7a)$ 10. _____
11. $(a^2 + 6b^2) + (9 - 3b^2) + (2a^2 - 10)$ 11. _____
12. $(4a + 6b - 3c) + (a - 4b + 7c) + (-2a + 2b + c)$ 12. _____

For Questions 13–18, find each product.

13. $x(x - 7)$ 13. _____
14. $(y^2 - 2)6y$ 14. _____
15. $-rs(r^2 + 5)$ 15. _____
16. $(-3x^2 + 2x - 11)4$ 16. _____
17. $-2m(7 - 4m + 3m^2)$ 17. _____
18. $5b(b^3 + 9b - 4)$ 18. _____
19. Solve $8a - 12 = -6(a - 5)$. 19. _____

NAME _____ DATE _____ PERIOD _____

13

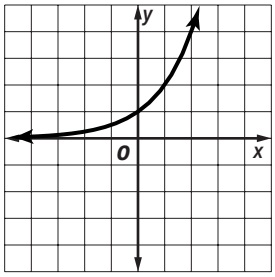
Chapter 13 Test, Form 3 *(continued)*

For Questions 20 and 21, determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.

20.

x	y
−11	18
−8	13
−5	8
−2	3

21.



20. _____

21. _____

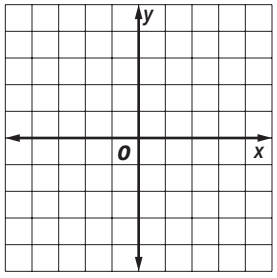
22. $y = \frac{6}{x - 1}$

22. _____

Graph each function.

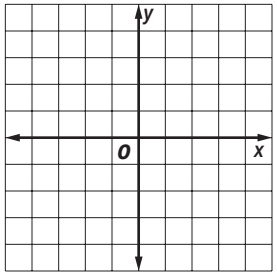
23. $y = \frac{1}{2}x^2 - 1$

23.



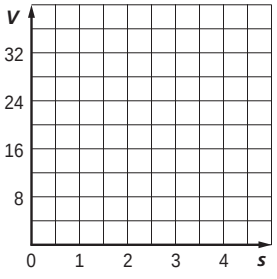
24. $y = \frac{1}{3}x^3 + 1$

24.



25. Write the function for the volume V of a rectangular prism as a function of a fixed height of 4 and a square base of varying lengths s. Then graph.

25. _____



Bonus A rectangle is 9 feet longer than it is wide. If the rectangle has a perimeter of 326 feet, how long is each side?

B: _____

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13

Chapter 13 Open-Ended Assessment

SCORE _____

Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem.

1. An algebraic expression that contains one or more monomials is called a polynomial.

a. Complete the table below.

Sample Polynomial	Number of Terms	Type of Polynomial	Degree of Polynomial
$\frac{3}{5}x^4$	1		
$3r^3 - r^2$			3
$a^2 + 2ab + b^2$			
$x^4y^3 + 4x^3y - 15xy^2$			

b. Write a trinomial that contains only one variable.

c. Write a monomial that contains exactly three variables.

d. Explain how your answers to parts b and c differ.

2. Tiles can be used to model polynomials.

a. Draw tiles to represent $3x^2 + 2x - 4$.

b. Draw tiles to find the sum $(2x^2 + x + 3) + (x^2 - 3x + 2)$. Explain each step.

c. Find two polynomials whose difference is $2x^2 - x + 3$. Draw tiles to demonstrate finding their difference.

3. Refer to the table at the right.

a. Graph the ordered pairs in the table.

b. Sketch a line or curve through the points.

c. Does your graph represent a *linear* or a *nonlinear* function? Explain.

d. Write a function that includes all of the ordered pairs in the table.

x	*y*
−2	−7
−1	0
0	1
1	2
2	9

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13

Chapter 13 Vocabulary Test/Review

SCORE _____

additive inverse	degree	polynomial
binomial	linear function	quadratic function
cubic function	nonlinear function	trinomial

Write whether each sentence is *true* or *false*. If false, replace the underlined word or number to make a true sentence.

1. A cubic function has a degree of 3. **1.** _____

2. The expression $5x^3$ is a polynomial. **2.** _____

3. The degree of the polynomial $4x^2y^3 + xy$ is 3. **3.** _____

4. The polynomial in any equation that represents a quadratic function has a degree of 3. **4.** _____

5. A polynomial with three terms is called a binomial. **5.** _____

6. The constant 0 has no degree. **6.** _____

7. A quadratic function has a graph that is a straight line. **7.** _____

8. You can subtract a polynomial by adding its reciprocal. **8.** _____

9. $6x^2 + 2x$ and $5x + 2$ are both examples of binomials. **9.** _____

10. Quadratic functions and cubic functions are both examples of nonlinear functions. **10.** _____

In your own words—
Define each term.

11. degree of a monomial

12. degree of a polynomial

NAME _____ DATE _____ PERIOD _____

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Chapter 13 Quiz

(Lessons 13–1 and 13–2)

SCORE _____

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

1. $r^2 + rs + 9$ **1.** _____

2. $\frac{xy}{z} - z$ **2.** _____

For Questions 3 and 4, find the degree of each polynomial.

3. xy **3.** _____

4. $4m + n$ **4.** _____

5. Which type of polynomial has two unlike terms? **5.** _____

Find each sum.

6. $(4m + 3) + (2m + 8)$ **6.** _____

7. $(6x + 2) + (x - 1)$ **7.** _____

8. $(9y - 4s) + (y + 7s)$ **8.** _____

9. $(6p^2 + 2p + 3) + (4p^2 + p + 6)$ **9.** _____

10. $(5x^2y - xy) + (-6x^2y)$ **10.** _____

Assessment

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Chapter 13 Quiz

(Lesson 13–3)

SCORE _____

Find each difference.

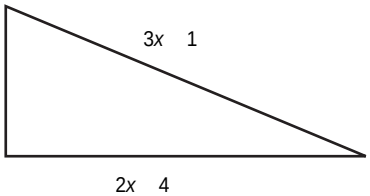
1. $(8y + 6) - (3y + 9)$ **1.** _____

2. $(4x + 2y) - (x + y)$ **2.** _____

3. $(3x^2 - 2x) - (x^2 + 5x)$ **3.** _____

4. $(12x^2 - 2) - (x + 5)$ **4.** _____

5. GEOMETRY The perimeter of the triangle shown at the right is $7x + 2$ units. Find the length of the missing side of the triangle. **5.** _____



NAME _____ DATE _____ PERIOD _____

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Chapter 13 Quiz

(Lessons 13–4 and 13–5)

SCORE _____

Find each product.

1. $3a(9 + a)$

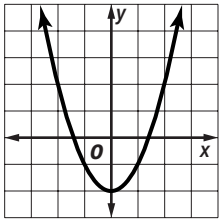
2. $-6c(c^4 - 2c^2 + 7)$

1. _____

For Questions 3 and 4, determine whether each graph or table represents a *linear* or *nonlinear* function. Explain.

2. _____

3.



4.

x	y
−2	40
5	30
12	20
19	10

3. _____

4. _____

5. Standardized Test Practice Which equation describes a linear function?

A. $a = (a + 3)5a$

B. $x + 9y = 15$

C. $-4t^2 + 3r = 7$

D. $y = 3m^3 + 1$

5. _____

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Chapter 13 Quiz

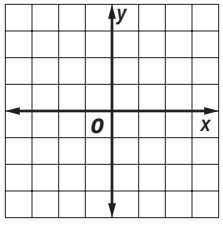
(Lesson 13–6)

SCORE _____

For Questions 1 and 2, graph each function.

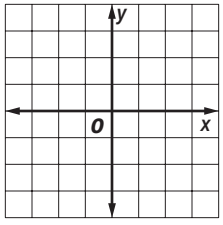
1. $y = -x^3$

1.



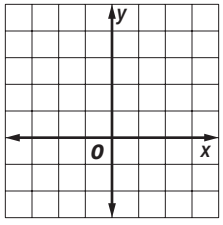
2. $y = x^3 - 1$

2.



3. Graph $y = 2x^2$ and $y = x^2$ on the same coordinate plane. Describe their similarities and differences.

3.



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Chapter 13 Mid-Chapter Test

SCORE _____

(Lessons 13–1 through 13–4)

Part I ***Write the letter for the correct answer in the blank at the right of each question.***

Find the degree of each polynomial.

1. $-12xy^2$
A. 1 **B.** 2 **C.** 3 **D.** 4 **1.** _____

2. $x^3 + x^2y^3 + y^6$
A. 3 **B.** 5 **C.** 6 **D.** 14 **2.** _____

For Questions 3–6 find each sum or difference.

3. $(m^2 + s) + (3m^2 + ms)$
A. $3m^2 + ms^2$ **B.** $4m^2 + ms + s$
C. $3m^4 + ms^2$ **D.** $4m^2 + ms^2$ **3.** _____

4. $(-4x^2 + x - 3) + (x^2 - 2x + 1)$
A. $-3x^2 - x - 2$ **B.** $-3x^4 - x^2 - 2$
C. $-5x^2 - 3x - 4$ **D.** $-4x^2 - 2$ **4.** _____

5. $(3t + 4r) - (-t - r)$
A. $4t + 5r$ **B.** $2t + 3r$ **C.** $3t + 4r$ **D.** $4t^2 + 5r^2$ **5.** _____

6. $(6y^2 + 5y - 3) - (4y^2 + 5y + 4)$
A. -5 **B.** $2y^2 + 5y - 7$ **C.** $2y^2 - 7$ **D.** $10y^2 + 1$ **6.** _____

7. Choose the expression that is *not* a binomial.
A. $3ab - 1$ **B.** $x^2 + y$ **C.** $m^3 - 2$ **D.** $\frac{1}{3}x + x$ **7.** _____

Part II

Determine whether each expression is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*.

8. $0.7x^3$ **9.** $\frac{x^2}{y} - \frac{2z}{w}$ **10.** $\frac{2}{3}m + \frac{1}{2}n - r$

8. _____

9. _____

10. _____

Find each sum or difference.

11. $(6x + 7) + (3x + 5)$ **11.** _____

12. $(-3b^2 + 4b - 6) + (3b^2 - 3b - 5)$ **12.** _____

13. $(7x + 4) - (3x + 1)$ **13.** _____

14. $(4a^2 - 4b + 5) - (2a^2 + 3b - 1)$ **14.** _____

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13

Chapter 13 Cumulative Review

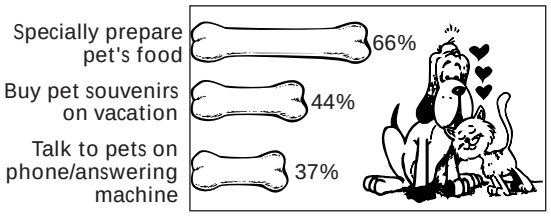
(Chapters 1–13)

1. Find the value of $\frac{3[4(5 + 2)]}{12}$. (Lesson 1-2) **1.** _____

2. Wei-Ling wants to start a lawn in an area that is 110 feet by 70 feet. One bag of seed covers 1200 square feet. How many bags should he buy? (Lesson 3-7) **2.** _____

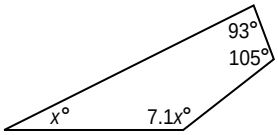
3. Write 2,850,000,000 in scientific notation. (Lesson 4-8) **3.** _____

4. Refer to the graph. Out of a group of 1150 pet owners, how many would you expect to say they would specially prepare a pet's food? (Lesson 6-9) **4.** _____



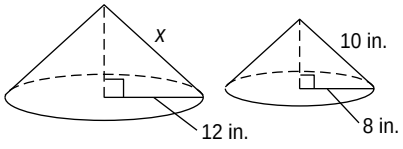
5. Find the slope of the line that passes through the points $A(-2, 6)$ and $B(5, -1)$. (Lesson 8-4) **5.** _____

6. Find the value of x. Then find the missing angle measures. (Lesson 10-4) **6.** _____



7. Find the surface area of a cone with radius 7 cm and slant height 10.5 cm. If necessary, round to the nearest tenth. (Lesson 11-5) **7.** _____

8. Find the missing measure for the pair of similar solids. (Lesson 11-6) **8.** _____



9. The stem-and-leaf plot shows the ages of students enrolled in a sign language course. How many of the students are less than 30 years old? (Lesson 12-1) **9.** _____

stem	leaf
0	9
1	0 4 4 6 7
2	2 2 3 4 7 9
3	0 1 1 6 8
4	2 7 9 9
5	1 1 3 8

3 | 0 = 30

10. Colin has a choice of a ham, turkey or roast beef sandwich on white, wheat, or sourdough bread and a choice of an apple, banana, or orange. How many lunches are possible? (Lesson 12-6) **10.** _____

Find each sum or difference. (Lessons 13-2 and 13-3) **11.** _____

11. $(6a - 9c) + (2a + 4c)$ **12.** $(9m + 5) - (-3m + 8)$ **12.** _____

13. Find the product $-3x(-5x + 3)$. (Lesson 13-4) **13.** _____

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13 Standardized Test Practice

(Chapters 1–13)

Part 1: Multiple Choice

Instructions: Fill in the appropriate oval for the best answer.

1. The area of a rectangle is 90 square meters. Its width is 15 meters. Find the perimeter. (Lesson 3–7)

A. 28 m **B.** 42 m **C.** 210 m **D.** 21 m **1.** Ⓐ Ⓑ Ⓒ Ⓓ

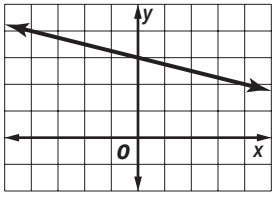
2. Find the quotient of $3\frac{3}{4}$ and $\frac{5}{7}$. (Lesson 5–4)

E. $5\frac{1}{4}$ **F.** $2\frac{2}{3}$ **G.** $\frac{4}{21}$ **H.** $3\frac{1}{28}$ **2.** Ⓔ Ⓕ Ⓖ Ⓗ

3. A discount shopping club sells a set of 4 books for \$9.99. Individually, each book sells for \$3.95. What is the percent of discount on each book? (Lesson 6–7)

A. 25% **B.** 37% **C.** 42% **D.** 58% **3.** Ⓐ Ⓑ Ⓒ Ⓓ

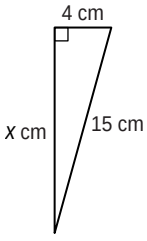
4. Find the slope of the line. (Lesson 8–4)



E. 4 **F.** -4

G. $\frac{1}{4}$ **H.** $-\frac{1}{4}$ **4.** Ⓔ Ⓕ Ⓖ Ⓗ

5. Find the value of x to the nearest tenth. (Lesson 9–5)



A. 4.4 cm **B.** 15.5 cm

C. 3.3 cm **D.** 14.5 cm **5.** Ⓐ Ⓑ Ⓒ Ⓓ

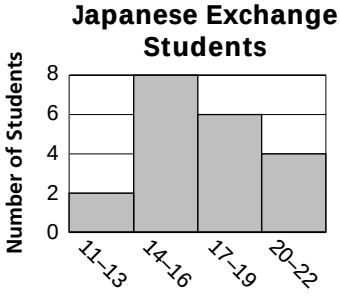
6. Mrs. Sato is putting a fence around her circular flower garden. The garden is 6 feet across the center. How long is the fence? (Lesson 10–7)

E. 6 ft **F.** 9.42 ft **G.** 18.84 ft **H.** 36.78 ft **6.** Ⓔ Ⓕ Ⓖ Ⓗ

7. Find the slant height of a square pyramid with a base side length of 5 cm and a surface area of 120 cm. (Lesson 11–5)

A. 12 cm **B.** 11.7 cm **C.** 5.4 cm **D.** 9.5 cm **7.** Ⓐ Ⓑ Ⓒ Ⓓ

8. The histogram shows the ages of the students in the Japanese exchange program. What is the total number of students involved in the exchange? (Lesson 12–4)



E. 20 **F.** 22

G. 24 **H.** 26 **8.** Ⓔ Ⓕ Ⓖ Ⓗ

NAME _____ DATE _____ PERIOD _____

13 Standardized Test Practice *(continued)*

9. One bag contains two red and four white beads. Another bag contains three green and four black beads. One bead is drawn from each bag. Find P(white and black). (Lesson 12–9)

A. $\frac{16}{21}$ **B.** $\frac{8}{42}$ **C.** $\frac{8}{21}$ **D.** $\frac{2}{13}$ **9.** Ⓐ Ⓑ Ⓒ Ⓓ

10. Find the sum $(3a - 6b + c) + (2a + 6b - 4c)$. (Lesson 13–2)

E. $6a - 4$ **F.** $5a + 5c$ **G.** $5a - 3c$ **H.** $5a + 12b$ **10.** Ⓔ Ⓕ Ⓖ Ⓗ

11. Find the difference $(8m + 6) - (-2m - 4)$. (Lesson 13-3)

A. $6m - 2$ **B.** $6m + 2$ **C.** $10m + 2$ **D.** $10m + 10$ **11.** Ⓐ Ⓑ Ⓒ Ⓓ

12. Find the product $-3x(3x - 2)$. (Lesson 13-4)

E. $-9x^2 + 6$ **F.** $-9x^2 - 6x$ **G.** $-9x^2 + 6x$ **H.** $-9x^2 - 6$ **12.** Ⓔ Ⓕ Ⓖ Ⓗ

13. Which equation represents a linear function? (Lesson 13-5)

A. $4xy = 15$ **B.** $y = \frac{1}{3}x$ **C.** $x^3 - 1 = y$ **D.** $y = x(x + 7)$ **13.** Ⓐ Ⓑ Ⓒ Ⓓ

Part 2: Grid In

Instructions: Enter your answer by writing each digit of the answer in a column box and then shading in the appropriate oval that corresponds to that entry.

14. The dimensions of a rectangular prism are: height 2.9 m, width 1.4 m, and length 3.01 m. Find the volume of the prism in cubic meters and round to the correct number of significant digits. (Lessons 11-2 and 11-7)

15. Find the degree of $13x^3 + xy - 0.5y^2$. (Lesson 13-1)

14.

	/	/	
.	.	.	.
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

15.

	/	/	
.	.	.	.
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Part 3: Short Response

Instructions: Write your answer in the blank at the right of each question.

16. Michael drops three quarters. What are the odds they will all land heads up? If he drops the quarters 100 times, about how many times should they land heads up? (Lesson 12-8) **16.** _____

17. Write an equation to represent the volume V of a cone with height $\frac{12}{\pi}$ and radius r. Is this equation a function? (Lesson 13-6) **17.** _____

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SCORE _____

Unit 5 Test

(Chapters 12–13)

For Questions 1–5, use the stem-and-leaf plot which shows the ages of members of a community chorus.

Stem	Leaf
2	4 5 7 7 9
3	3 3 7 8 8 8 8 9
4	2 5 5 8 8 8 9 9 9
5	0 0 3 4 4 5 6 6 7 9 9
6	0 0 1 1 1 3 5 5

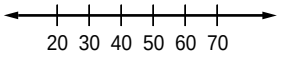
2 | 4 = 24

1. How old is the oldest member of the chorus? **1.** _____

2. In which interval do most of the ages occur? **2.** _____

3. What is the median age of the members? **3.** _____

4. Make a box-and-whisker plot of the data. **4.**

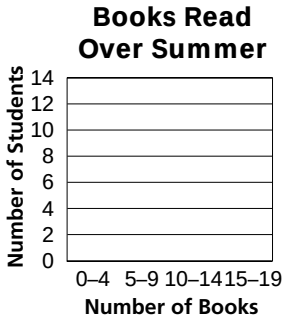


5. Find the interquartile range. **5.** _____

For Questions 6 and 7, use the data in the table.

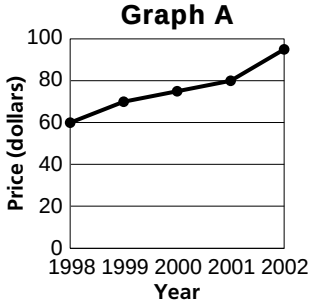
Books Read Over Summer		
Books	**Tally**	**Frequency**
0–4	𝍸 ||	7
5–9	𝍸 𝍸 ||||	14
10–14	𝍸	5
15–19	|||	3

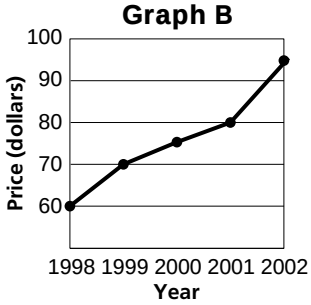
6. Display the set of data in a histogram. **6.**



7. How many students read at least 5 books? **7.** _____

8. Which graph appears to show a greater increase in the price of one share of XYZ stock? Explain. **8.** _____





9. A sheet set is available in red, green, purple, or blue and a choice of twin, queen, or king size. Find the number of different sheet sets you can buy. **9.** _____

10. Three coins are tossed. What is the probability of two tails and one head? **10.** _____

NAME _____ DATE _____ PERIOD _____

Unit 5 Test *(continued)*

(Chapters 12–13)

For Questions 11 and 12, tell whether each situation is a *permutation* or *combination*. Then solve.

11. Steve has 9 mystery books. How many ways can he arrange them on a bookshelf? **11.** _____

12. How many ways can you choose 4 pair of socks out of 12 pair for a trip? **12.** _____

13. Two number cubes are rolled. What are the odds of getting a sum less than 7? **13.** _____

14. Danielle has 3 dimes, 2 quarters, and 5 nickels in her pocket. What is the probability that she chooses a dime followed by a quarter? **14.** _____

15. An eight-sided die is rolled, find P(5 or even). **15.** _____

16. Determine whether $\frac{1}{2}x + xy$ is a polynomial. If it is, classify it as a *monomial*, *binomial*, or *trinomial*. **16.** _____

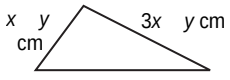
17. Find the degree of $xy + 3x^2y - 9$. **17.** _____

For Questions 18 and 19, find each sum or difference.

18. $(a^2 + b) + (5a^2 + ab)$ **18.** _____

19. $(3x^2 + 6x - 3) - (x^2 + 8x + 7)$ **19.** _____

20. The perimeter of the triangle is $7x + 2y$ centimeters. Find the length of the third side. **20.** _____



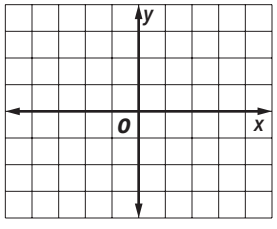
For Questions 21 and 22, find each product. **21.** _____

21. $x(3x - 1)$ **22.** $-4a(10 - 2a)$ **22.** _____

23. Find the perimeter of a square with side length $2x - y$ centimeters. **23.** _____

24. Determine whether $y = 0.4x^2$ is a *linear* or *nonlinear* equation. Explain. **24.** _____

25. Graph $y = -2x^3 + 1$. **25.**



NAME _____ DATE _____ PERIOD _____

Second Semester Test

(Chapters 6–13)

SCORE _____

For Questions 1–20, write the letter for the correct answer in the blank at the right of each question.

1. What value of p makes $\frac{14}{p} = \frac{3.5}{9}$ a proportion?

A. 18 **B.** 7 **C.** 36 **D.** 27 **1.** _____

2. Sheri was told by the restaurant hostess that her party could be seated when 75% of her guests arrived. If Sheri was expecting 28 guests, how many must arrive before her party can be seated?

A. 7 **B.** 21 **C.** 25 **D.** 16 **2.** _____

3. Solve $-2(k + 6) < 20$.

A. $k < -16$ **B.** $k > -16$ **C.** $k < -7$ **D.** $k > -7$ **3.** _____

4. Solve $8x - 2 < 30$.

A. $x < 4$ **B.** $x > -4$ **C.** $x < 3.5$ **D.** $x > -3.5$ **4.** _____

5. The ideal gas law says that the pressure of a gas varies directly with the volume of the container holding the gas. If the pressure is 2 atmospheres when the volume is 3 liters, predict the pressure when the volume is 1 liter.

A. 1 atmosphere **B.** $\frac{2}{3}$ atmosphere

C. $\frac{3}{2}$ atmosphere **D.** 6 atmospheres **5.** _____

6. Which equation could be a best-fit line for the data in the table?

x	2	5	8	10	13
y	2500	2100	1300	900	500

A. $y = -x + 2500$ **B.** $y = 100x + 2500$

C. $y = 0.005x + 3000$ **D.** $y = -200x + 3000$ **6.** _____

7. Determine which of the following is *not* a solution to the linear inequality $5x + 7y > 4$.

A. $\left(0, \frac{5}{7}\right)$ **B.** $\left(\frac{9}{10}, 0\right)$ **C.** $(1, 1)$ **D.** $(-1, 1)$ **7.** _____

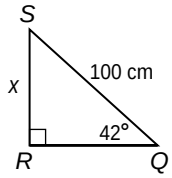
8. Solve $d^2 = 70$. Round to the nearest tenth.

A. 8.4, −8.4 **B.** 8.3, −8.3 **C.** 8.4 **D.** −9.0 **8.** _____

9. Find the length of the hypotenuse of a right triangle if the lengths of the legs are 48 and 64 inches.

A. 112 in. **B.** 14.9 in. **C.** 80 in. **D.** 56 in. **9.** _____

10. In the triangle at the right, find the missing measure to the nearest tenth.



A. 67.0 cm **B.** 66.9 cm **C.** 74.3 cm **D.** 74.0 cm **10.** _____

NAME _____ DATE _____ PERIOD _____

Second Semester Test *(Continued)*

(Chapters 6–13)

11. A figure has a vertex $(x, -y)$. Find the coordinates of the transformed vertex after a reflection over the x-axis.

A. $(-x, -y)$ **B.** $(-x, y)$ **C.** (x, y) **D.** $(x, -y)$ **11.** _____

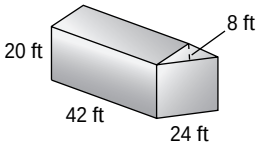
12. Determine the measure of an interior angle in a regular 12-gon.

A. 150° **B.** 216° **C.** 180° **D.** 240° **12.** _____

13. Find the area of a circle with diameter 14 m.

A. 43.98 m^2 **B.** 153.94 m^2 **C.** 615.75 m^2 **D.** 21.99 m^2 **13.** _____

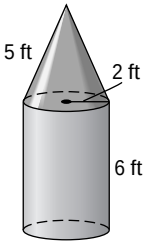
14. Find the volume of the solid at the right.



A. 21,256 ft^3 **B.** 24,192 ft^3

C. 25,928 ft^3 **D.** 23,672 ft^3 **14.** _____

15. Find the surface area of the solid at the right.



A. 83.4 ft^2 **B.** 100.5 ft^2

C. 175.9 ft^2 **D.** 119.4 ft^2 **15.** _____

16. Rico measures the inside of a picture frame to be 7.7 cm by 12.7 cm. What is the area inside the picture frame? Round to the correct number of significant digits.

A. 97.79 cm^2 **B.** 98 cm^2 **C.** 97.8 cm^2 **D.** 97 cm^2 **16.** _____

17. A box holds 26 cards each with a different letter of the alphabet. What are the odds of drawing one of the letters in the word *MATH*?

A. 2:13 **B.** 2:11 **C.** 3:26 **D.** 11:13 **17.** _____

18. Elena has 10 blue, 2 yellow, 4 purple, and 9 red hair clips in a drawer. If she chooses two without looking, what is the probability she will pick a red clip followed by a blue clip?

A. $\frac{2}{15}$ **B.** $\frac{3}{20}$ **C.** $\frac{19}{25}$ **D.** $\frac{18}{125}$ **18.** _____

19. What is the product of $-4x$ and $x + 2$?

A. $-4x^2 - 8$ **B.** $-4x^2 - 8x$ **C.** $-4x^2 - 4x$ **D.** $-4x - 8$ **19.** _____

20. Which equation represents a nonlinear function?

A. $y = \frac{x}{3}$ **B.** $y = 6x$ **C.** $y = \frac{2}{x}$ **D.** $y = -\frac{1}{4}x$ **20.** _____

NAME _____ DATE _____ PERIOD _____

Second Semester Test *(Continued)*

(Chapters 6–13)

21. Victor will make a scale model of a bridge. He wants the width of the model to be 3 inches. The actual width of the bridge is 90 feet. What scale should he use? **21.** _____

22. Kimiko borrows \$450 at an interest rate of 8.5% per year for 3 years. How much interest will she have to pay? **22.** _____

23. Find the percent of change from \$97 to \$83.42. State whether the change is an increase or decrease. **23.** _____

24. Suppose a number cube is rolled. What is the probability of rolling a number less than 3? **24.** _____

25. Solve $8(x - 1) + 4 = 9x - 8$. **25.** _____

26. Three times the sum of three consecutive integers is 99. What are the integers? **26.** _____

27. Solve $\frac{b}{5} > -4.3$. **27.** _____

28. Find the value of c so that $(c, 5)$ is a solution to $2x + 3y = 7$. **28.** _____

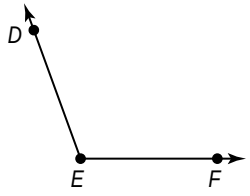
29. Find the x-intercept and y-intercept for the graph of $4x - 2y = 0$. **29.** _____

30. What is the slope of the line $x = -\frac{2}{3}$? **30.** _____

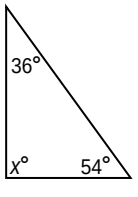
31. Write an equation in slope-intercept form for the line passing through $(-2, 6)$ and $(4, -3)$. **31.** _____

32. Solve the system of equations by substitution. $y = 3x - 8$ and $y = 10$ **32.** _____

33. Use a protractor to find the measure of $\angle DEF$ and then classify the angle as *acute*, *obtuse*, or *right*. **33.** _____



34. Find the value of x in the triangle at the right. Then classify the triangle as *acute*, *right*, or *obtuse*. **34.** _____



35. Find the distance between $Q(5, 9)$ and $R(-4, -6)$. Round to the nearest tenth. **35.** _____

36. Find $m\angle B$ if $m\angle A = 27°$ and $\angle A$ and $\angle B$ are complementary. **36.** _____

37. If $\triangle ABC \cong \triangle DEF$, which segment is congruent to $\overline{CA}$? **37.** _____

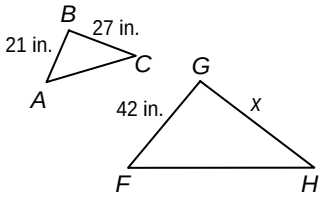
38. Find the area of a parallelogram with a base of 15 meters and a height of 9 meters. **38.** _____

NAME _____ DATE _____ PERIOD _____

Second Semester Test *(Continued)*

(Chapters 6–13)

39. In the figure at the right, $\triangle ABC \sim \triangle FGH$. Find the value of x.

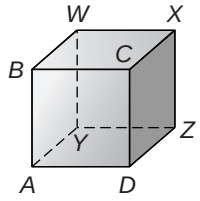


39. _____

40. Ben's cart has a wheel that measures 21 inches in diameter. Find the circumference of the wheel.

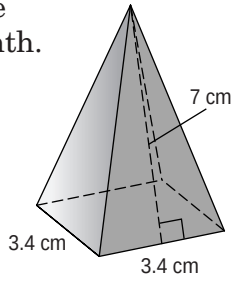
40. _____

41. Identify the solid at the right. Name the faces, edges, and vertices.



41. _____

42. Find the surface area of the pyramid at the right. If necessary, round to the nearest tenth.



42. _____

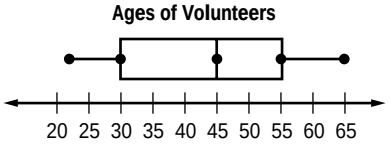
43. Aisha has two pyramid-shaped candles. One has a 4-inch square base and a slant height of 5 inches. The other has a 3-inch square base. Assuming the candles are similar, what is the slant height of the other candle?

43. _____

44. Find the volume of a rectangular prism with length 4.24 in., width 1.07 in., and height 6.0 in. Round to the correct number of significant digits.

44. _____

45. The box-and-whisker plot shows the ages of volunteers answering phones at a public television fund drive. Half of the volunteers are under what age?



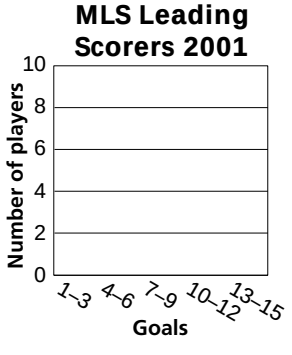
45. _____

46. Display the set of data in a histogram.

MLS Leading Scorers 2001		
Amount	**Tally**	**Frequency**
1–3	|	1
4–6	𝍸 ||	7
7–9	𝍸 ||||	9
10–12	||||	4
13–15	||||	4

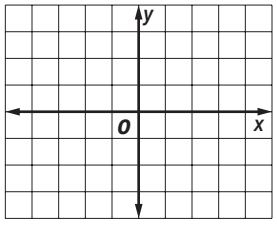
Source: www.soccernet.com

46.



47. Graph the function $y = -0.5x^3$.

47.



NAME _____ DATE _____ PERIOD _____

Final Test

(Chapters 1–13)

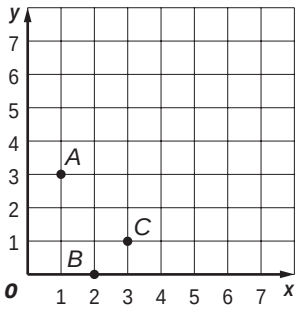
SCORE _____

For Questions 1–30, write the letter for the correct answer in the blank at the right of each question.

1. Find the value of $18 + 6 \div 3 + 1$.

A. 19.5 **B.** 9 **C.** 6 **D.** 21 **1.** _____

2. Which table shows the set of ordered pairs that are graphed on the coordinate system?



A.

x	1	0	3
y	4	2	1

B.

x	2	3	4
y	1	0	1

C.

x	3	2	1
y	1	0	3

D.

x	4	0	1
y	1	2	3

2. _____

3. Use the formula $K = |a| - |b|$ to find the value of K if $a = 729$ and $b = -871$.

A. –1600 **B.** –142 **C.** 1600 **D.** 142 **3.** _____

4. Find the average of the daily low temperatures.
18°F, 12°F, 0°F, −5°F, −9°F, 11°F, 15°F

A. 6°F **B.** 7°F **C.** 10°F **D.** 0°F **4.** _____

5. If you interchange the coordinates of any point in Quadrant II, the new point would be in which quadrant?

A. I **B.** II **C.** III **D.** IV **5.** _____

6. Carla collected z pounds of trash on a city clean-up day. Odell collected three times as much. Kai collected 8 pounds less than Odell. Which expression represents the number of pounds of trash collected?

A. $7z + 8$ **B.** $7z - 8$ **C.** $4z - 8$ **D.** $4z + 8$ **6.** _____

7. City Hall is 27 feet taller than the town library. If their combined height is 293 feet, how tall is the library?

A. 133 ft **B.** 320 ft **C.** 266 ft **D.** 120 ft **7.** _____

8. Which number is *not* a prime factor of 385?

A. 11 **B.** 7 **C.** 5 **D.** 3 **8.** _____

9. Evaluate $(4b^2)^{-1}$ if $b = 3$.

A. –36 **B.** $\frac{1}{12}$ **C.** $\frac{1}{36}$ **D.** $\frac{4}{9}$ **9.** _____

10. Determine which number is less than 1.008×10^{-3}.

A. 1.080×10^{4} **B.** 0.01008 **C.** 1.18×10^{-4} **D.** 1.8×10^{-3} **10.** _____

NAME _____ DATE _____ PERIOD _____

Final Test *(continued)*

(Chapters 1–13)

11. Which decimal is equivalent to $\frac{2}{11}$?

A. $0.\overline{27}$ **B.** $0.1\overline{66}$ **C.** $0.\overline{18}$ **D.** $0.1\overline{88}$ **11.** _____

12. Solve $c + 2\frac{1}{2} = 5\frac{5}{9}$.

A. $3\frac{1}{18}$ **B.** $3\frac{4}{7}$ **C.** $8\frac{1}{18}$ **D.** $2\frac{2}{9}$ **12.** _____

13. State the next term in the sequence 0.004, 0.02, 0.1, 0.5, … .

A. 0.05 **B.** 2.5 **C.** 1.0 **D.** 0.25 **13.** _____

14. A jam recipe calls for 9 cups of sugar for 12 pints of jam. How many cups of sugar are needed to make 18 pints of jam?

A. 18 **B.** 12 **C.** $13\frac{1}{2}$ **D.** 24 **14.** _____

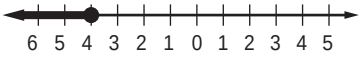
15. Which scale has a scale factor of $\frac{1}{12}$?

A. 3 ft = 4 yd **B.** 4 ft = 16 yd **C.** 9 ft = 24 yd **D.** 2 ft = 6 yd **15.** _____

16. Lisa buys a radio marked $60. She receives a 20% discount. Find the selling price of the radio.

A. $46.75 **B.** $40 **C.** $37.50 **D.** $48 **16.** _____

17. Choose the inequality for the graph.



A. $x \leq -4$ **B.** $x < -4$

C. $x \geq -4$ **D.** $x > -4$ **17.** _____

18. Solve $\frac{x}{-7} \geq 8$.

A. $x \geq -56$ **B.** $x \geq 56$ **C.** $x \leq -56$ **D.** $x \leq 56$ **18.** _____

19. Find the x-intercept and the y-intercept for the graph of $27x - 18y = 54$.

A. 3; –2 **B.** $\frac{1}{2}$; $\frac{1}{3}$ **C.** 2; –3 **D.** 4, 3 **19.** _____

20. Find the slope of the line that passes through $A(-7, 1)$ and $B(2, -5)$.

A. $-\frac{2}{3}$ **B.** $-\frac{9}{6}$ **C.** $\frac{5}{4}$ **D.** $\frac{4}{9}$ **20.** _____

21. Write an equation in slope-intercept form for the table of values.

x	−2	0	2	4
y	5	1	−3	−7

A. $y = \frac{1}{2}x + 6$ **B.** $y = -\frac{1}{2}x + 3$ **C.** $y = 2x + 9$ **D.** $y = -2x + 1$ **21.** _____

22. In $\triangle RST$, $m\angle R = 27°$ and $m\angle S = 31°$. Find $m\angle T$.

A. 122° **B.** 52° **C.** 48° **D.** 302° **22.** _____

NAME _____ DATE _____ PERIOD _____

Final Test *(continued)*

(Chapters 1–13)

23. Tina rests a 35-foot ladder against a wall. The top of the ladder hits the wall at a point 32 feet above the ground. How far from the wall is the foot of the ladder? Round to the nearest tenth.

A. 3.0 ft **B.** 4.7 ft **C.** 14.2 ft **D.** 8.2 ft **23.** _____

24. If angles A and B are complementary and $m\angle A = 23°$, find $m\angle B$.

A. 46° **B.** 157° **C.** 67° **D.** 23° **24.** _____

25. In quadrilateral $ABCD$, $m\angle A = 112°$, $m\angle B = 37°$, $m\angle C = 11°$. Find $m\angle D$.

A. 180° **B.** 200° **C.** 20° **D.** 360° **25.** _____

26. Find the area of a trapezoid with bases of 10 inches and 12 inches and a height of 20 inches.

A. 220 in^2 **B.** 2400 in^2 **C.** 440 in^2 **D.** 396 in^2 **26.** _____

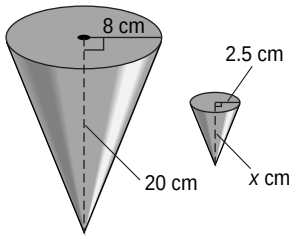
27. Find the volume of a cone with radius 9 centimeters and height 4 centimeters.

A. 108 cm^3 **B.** 508.9 cm^3 **C.** 339.3 cm^3 **D.** 476.9 cm^3 **27.** _____

28. Find the missing measure for the pair of similar solids.

A. 6.25 cm **B.** 8 cm

C. 14.5 cm **D.** 5 cm **28.** _____



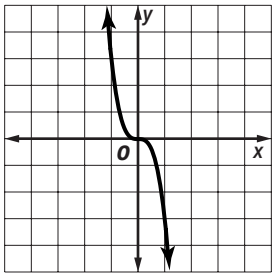
29. How many ways can 6 glass figurines be displayed on a shelf?

A. 36 **B.** 6 **C.** 120 **D.** 720 **29.** _____

30. Which equation represents the graph?

A. $y = -3x^2$ **B.** $y = 3x^2$

C. $y = -3x^3$ **D.** $y = 3x^3$ **30.** _____



NAME _____ DATE _____ PERIOD _____

Final Test *(continued)*

(Chapters 1–13)

31. Simplify $(5 \cdot t) \cdot 9$. **31.** _____

32. A plumber charges $35 for each hour spent on the job. The plumber's bill for one job is $105. Define a variable. Then write an open sentence that can be used to find the number of hours the plumber spent on this job. **32.** _____

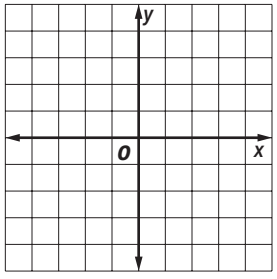
33. Determine whether a scatter plot of the data for outside temperature and amount of air-conditioning bill might show a *positive*, *negative*, or *no* relationship. Explain your answer. **33.** _____

Evaluate each expression.

34. $|x + z| + y$, if $x = 5$, $y = 2$, and $z = -4$. **34.** _____

35. $6b + (-34b)$, if $b = 2$. **35.** _____

36. Make a table of values and graph six sets of ordered pairs for $x - y = 4$. **36.** _____



37. Use the distributive property to write $14(w - 4)$ as an equivalent algebraic expression. **37.** _____

Write and solve an equation for each sentence.

38. When 8 is subtracted from a number, the result is 18. **38.** _____

39. The product of a number and –9 is –63. **39.**

40. Express 793 in expanded form. **40.** _____

41. Find the GCF of $16ab$ and $24a^2$. **41.** _____

42. Find the product of $(-9x^2)(4xy^3)$. **42.** _____

43. Write $0.7\overline{3}$ as a fraction. **43.** _____

44. Find $\frac{3a}{8b} \div \frac{4a^2}{5}$. Write in simplest form. **44.** _____

45. Kira earns these scores in history: 75, 80, 80, 80, 83, 85, 88, 90, 97, 100. Find the median of the test scores. **45.** _____

NAME _____ DATE _____ PERIOD _____

Final Test *(continued)*

(Chapters 1–13)

46. Express *96 words in 1.5 minutes* as a unit rate. **46.** _____

47. Find the percent of change from 126 miles to 147 miles. Round to the nearest tenth, if necessary. **47.** _____

48. What is the probability that a person chosen at random was born on a Saturday or Sunday? **48.** _____

49. Solve $9z - 5 = 37 - 3z$. **49.** _____

50. Solve $4(2x - 1) + 6 = 8x - 3$. **50.** _____

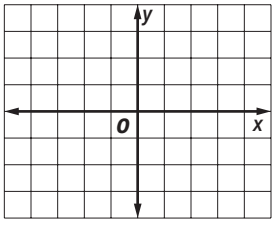
51. Solve $b + \frac{1}{7} < \frac{9}{14}$. **51.** _____

52. Six times a number less 5 is less than two times a number plus 7. For what number or numbers is this true? **52.** _____

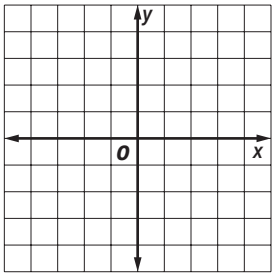
53. Determine whether the relation is a function. {(–31, 100), (29, –289), (48, 692), (–490, 133), (140, 100)} **53.** _____

54. Suppose y varies directly with x. Write an equation relating x and y if $y = -4$ when $x = 6$. **54.** _____

55. Graph the equation of a line with slope $\frac{1}{3}$ and y-intercept 0. **55.**



56. Graph $y < 3x - 1$. **56.**



57. Use a protractor to draw an angle that measures 67°. Then classify the angle as *acute*, *obtuse*, *right*, or *straight*. **57.** _____

NAME _____ DATE _____ PERIOD _____

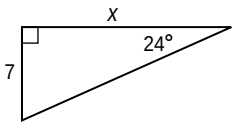
Final Test *(continued)*

(Chapters 1–13)

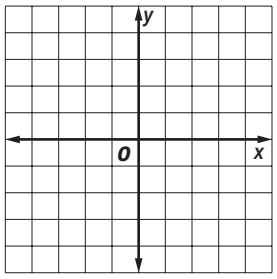
58. Find the distance between $W(10, -4)$ and $X(-16, 5)$. Round to the nearest tenth, if necessary. **58.** _____

59. Courtney has a photo of herself and her dog. Her image is 2.5 inches high and the image of the dog is 0.5 inches high. Courtney is 5.5 feet tall. How tall is the dog? **59.** _____

60. For the triangle, find the missing measure to the nearest tenth. **60.** _____



61. The vertices of a figure are $A(-4, 1)$, $B(-2, 4)$, $C(1, -1)$, $D(-3, -2)$. Graph the image of the figure after a rotation of 90° clockwise. **61.**



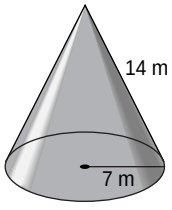
62. Find the perimeter of a regular nonagon having sides 3.7 inches long. **62.** _____

63. A circle has an area of 254.34 in^2. Find the radius. **63.** _____

64. Anil is making a poster that measures 36 inches high and 24 inches wide. Anil adds a 3-inch wide decorative border to all sides of the poster. What is the area of the border? **64.** _____

65. Find the volume of a cylinder with a 7.5 cm radius and a height of 10 cm. If necessary, round to the nearest tenth. **65.** _____

66. Find the surface area of the cone at the right. Round to the nearest tenth. **66.** _____



67. Find the surface area of a cube with an edge 12 centimeters long. Round to the correct number of significant digits. **67.** _____

68. List the set of data represented by the stem-and-leaf plot. Then find the median. **68.** _____

Stem	Leaf
0	1 1 2 4 7
1	3 8 9 9
2	0 2 2 4 5 6 8
3	1 7

1 | 8 = 18

69. An eight-sided die is rolled. What is the probability of rolling a prime number or a 6? **69.** _____

70. Find $-3k(8k^5 - 7k^2)$. **70.** _____

NAME _____ DATE _____ PERIOD _____

13 Standardized Test Practice

Student Record Sheet *(Use with pages 702–703 of the Student Edition.)*

Part 1 Multiple Choice

Select the best answer from the choices given and fill in the corresponding oval.

1	Ⓐ Ⓑ Ⓒ Ⓓ	**4**	Ⓐ Ⓑ Ⓒ Ⓓ	**7**	Ⓐ Ⓑ Ⓒ Ⓓ
2	Ⓐ Ⓑ Ⓒ Ⓓ	**5**	Ⓐ Ⓑ Ⓒ Ⓓ	**8**	Ⓐ Ⓑ Ⓒ Ⓓ
3	Ⓐ Ⓑ Ⓒ Ⓓ	**6**	Ⓐ Ⓑ Ⓒ Ⓓ	**9**	Ⓐ Ⓑ Ⓒ Ⓓ

Part 2 Short Response/Grid In

Solve the problem and write your answer in the blank.

For Questions 10 and 11, also enter your answer by writing each number or symbol in a box. Then fill in the corresponding oval for that number or symbol.

10 _____ (grid in)

11 _____ (grid in)

12 _____

13 _____

14 _____

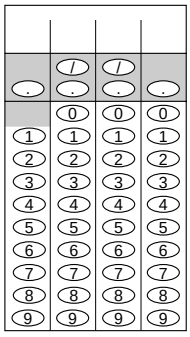
15 _____

16 _____

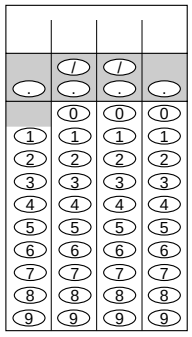
17 _____

18 _____

10



11



Part 3 Open Ended

Record your answers for Questions 19–20 on the back of this paper.

Answers