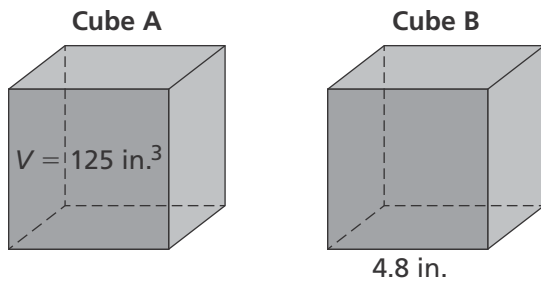


Name _____

1. How would you write $0.\overline{7}$ as a fraction? **1 point**

- (A) $\frac{5}{8}$
- (B) $\frac{6}{7}$
- (C) $\frac{7}{9}$
- (D) $\frac{7}{100}$

2. Cube A has a volume of 125 cubic inches. The edge lengths of Cube B measure 4.8 inches. Which cube is larger? Explain. **2 points**

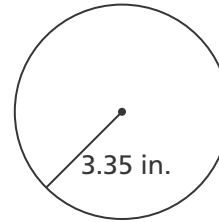


Cube A; Sample answer: The edges of Cube A are 5 inches and the volume of Cube B is about 111 cubic inches.

3. Which fraction is equivalent to a whole number? Select all that apply. **1 point**

- $\frac{9}{3}$
- $-\frac{16}{8}$
- $\frac{7}{0}$
- $-\frac{5}{3}$
- $\frac{0}{5}$

4. A personal-size pizza has the radius shown in the diagram.



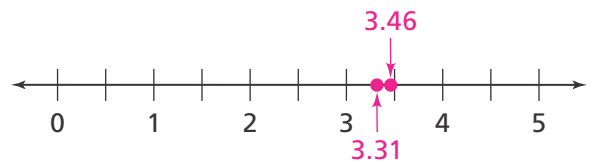
Part A

Will the pizza fit on a plate with a radius of $\sqrt{10}$ inches or a radius of $\sqrt{12}$ inches? Explain. **2 points**

$\sqrt{12}$ inches; Sample answer: $\sqrt{12} \approx 3.46$ and $\sqrt{10} \approx 3.16$. The plate with a radius of $\sqrt{10}$ inches is too small.

Part B

Plot each plate's radius at its approximate location on a number line. **1 point**



5. Which of the following numbers is irrational? Select all that apply. **1 point**

- 6.7234724...
- $\frac{315}{8}$
- 0.25
- $\sqrt{7}$
- $\frac{17}{36}$

6. A cube-shaped dog kennel is replaced by a larger kennel. The volume of the original kennel was 27 cubic feet. The volume of the new kennel is 64 cubic feet. How many feet were added to each edge length of the kennel? **1 point**

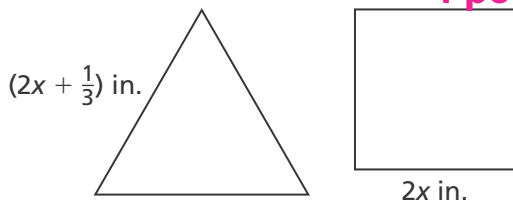
- A 1 foot
- B 2 feet
- C 3 feet
- D 4 feet

7. Solve for x in the equation below.

$$(x - 2) = -\frac{1}{4}(x - 8) \quad \mathbf{1 \text{ point}}$$

$$x = 3\frac{1}{5}$$

8. A square has side lengths of $2x$ inches. An equilateral triangle has side lengths of $(2x + \frac{1}{3})$ inches. If the square and the triangle have the same perimeter, what is the value of x ? **1 point**



$$\frac{1}{2} \text{ inch}$$

9. Kevin recorded the distances he ran last week. The total number of miles he ran on Monday through Wednesday is the same as the total number of miles he ran on Thursday and Friday.

Distance Ran

Mon	Tues	Wed	Thurs	Fri
x	$x + 9$	$x + 4$	$2x$	$4x - 2$

Part A

Write and simplify an equation that represents the situation. **1 point**

Sample answer:

$$x + x + 9 + x + 4 = 2x + 4x - 2;$$

$$3x + 13 = 6x - 2$$

Part B

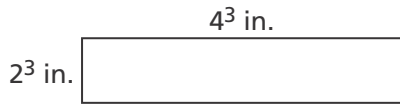
How many miles did Kevin run on Wednesday? **1 point**

9 miles

10. A silicon chip is 14 nanometers thick. A nanometer is equal to 0.000000001 meter. Express the thickness of the chip using scientific notation. **1 point**

- A 1.4×10^{-9} m
- B 1.4×10^{-8} m
- C 1.4×10^8 m
- D 1.4×10^9 m

11. What is the area of the bulletin board? **1 point**



- (A) 6^3 in.²
(B) 8^3 in.²
(C) 8^6 in.²
(D) 8^9 in.²
-
12. Rico earns a weekly salary of \$750 and a 5% total commission on his sales. Sean earns a weekly salary of \$1,100 and a 2.5% commission on sales. What amount of sales will result in each of them earning the same amount for the week? **1 point**
- (A) \$140
(B) \$350
(C) \$1,850
(D) \$14,000
-
13. There are approximately 330,000,000 cubic miles of water on Earth. A cubic mile is approximately 147,200,000,000 cubic feet. How much water is on Earth? Estimate using scientific notation. **1 point**
- (A) 5×10^{17} ft³
(B) 5×10^{18} ft³
(C) 5×10^{19} ft³
(D) 5×10^{88} ft³

14. Which expression is equivalent to $3^{12} \cdot 7^9$? Select all that apply. **1 point**
- $3^3 \cdot 3^4 \cdot 4^9$
 $(3^3)^9 \cdot (7^3)^6$
 $7^3 \cdot (3^{-4})^{-3} \cdot 7^6$
 $(3^3 + 3^9) \cdot (7^6 + 7^3)$
 $3^{20} \cdot (7^3)^3 \cdot (3^4)^{-2}$

-
15. Mercury is the closet planet to the Sun at a distance of 36 million miles. The closest star to the Sun is Proxima Centauri, which is 4.24 light years away. A light year is 5.9×10^{12} miles.

Part A

Write the distance in miles from Mercury to the Sun in scientific notation. **1 point**

3.6×10^7 miles

Part B

How many miles from the Sun is Proxima Centauri? Express your answer in scientific notation. **1 point**

2.5016×10^{13} miles

Part C

About how many times greater is the distance from the Sun to Proxima Centauri compared to the distance from the Sun to Mercury? Express your answer in scientific notation. **1 point**

**Approximately
 7×10^5 times greater**

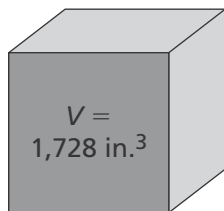
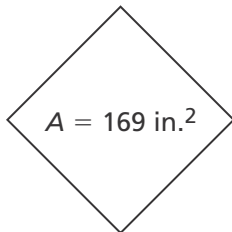
16. Draw lines to match each exponential number on the left to its equivalent on the right. **1 point**

7^{-2}	$\frac{1}{11}$
3^{-4}	$\frac{1}{49}$
9^0	1
11^{-1}	$\frac{1}{81}$

17. Find $\frac{6.3 \times 10^{-5}}{9 \times 10^{-3}}$. Write your answer in scientific notation. **1 point**

$$7 \times 10^{-3}$$

18. Can square pieces of foam board, each with an area of 169 square inches, be cut and used to construct a cube with a volume of 1,728 cubic inches? Explain. **2 points**



Yes; Sample answer:
Each edge of the cube is 12 inches, while each side of the foam board is 13 inches.

19. What are the slope and y-intercept of the line $4y = -x - 32$? **2 points**

The slope is $-\frac{1}{4}$ and the y-intercept is -8 .

20. Dante's soccer team sells T-shirts to raise money for new equipment. For each T-shirt sold, the team raises \$8. Parents also make a donation of \$100 toward the equipment.

Part A

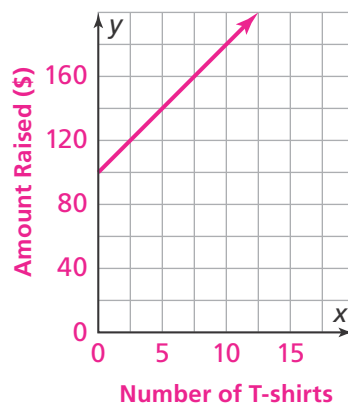
What is the equation that represents the total amount raised, y , if x T-shirts are sold? **1 point**

$$y = 8x + 100$$

Part B

Draw a graph of the linear equation from Part A. **2 points**

Sample answer:



21. How many solutions does the equation below have? **1 point**

$$2x - 7 + 19 = 6x - 4x + 12$$

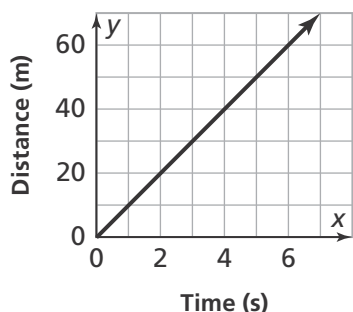
- (A) No solution
- (B) 1 solution
- (C) 2 solutions
- (D) Infinitely many solutions

22. Selena was comparing the flying speeds of different birds in science class.

Robin's Flight

Time (s)	2	3	4	5	6
Distance (m)	30	45	60	75	90

Blue Jay's Flight



Part A

Which bird flies faster? **1 point**

The robin

Part B

The distance in meters, y , a cardinal travels in x seconds is $y = 10x$. Does the cardinal travel faster than the blue jay? Explain. **2 points**

No; Sample answer: The cardinal and blue jay fly at the same speed.

23. China has a population of approximately 1,382,323,332 people. The population of the United States is about 324,118,787 people.

Part A

Approximate each population using scientific notation. Round the first factor to the nearest tenth. **2 points**

China: 1.4×10^9 people; United States: 3.2×10^8 people

Part B

About how many more people live in China than in the United States? Express your answer using scientific notation.

1 point

1.08×10^9 people

24. What is the value of n in the equation $2.3 \times 10^9 = (1 \times 10^3)(2.3 \times 10^n)$?

1 point

$n = 6$

25. Shawna has \$750 in the bank. She deposits \$37.50 each week. Ruben has \$850 in the bank. He deposits his paycheck of \$102.75 every Monday, and he spends about \$70.25 each week. After how many weeks will they have the same amount of money in the bank? **1 point**

- (A) 5 weeks
- (B) 2 weeks
- (C) 15 weeks
- (D) 20 weeks

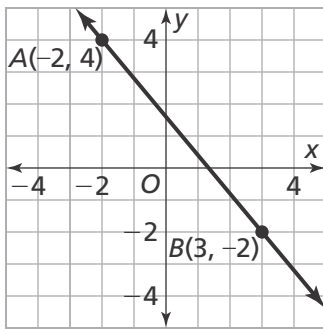
26. Katrina wants to build a fence around her square garden. Her garden has an area of 121 square feet. How much fencing will Katrina need? **1 point**

- (A) 13 feet
- (B) 26 feet
- (C) 39 feet
- (D) 44 feet

27. Complete the table. **1 point**

Exponent Form	Simplified Form
6^{-1}	$\frac{1}{6}$
6^{-2}	$\frac{1}{36}$
6^{-3}	$\frac{1}{216}$
6^{-4}	$\frac{1}{1,296}$

28. Find the slope of the line. **1 point**



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

29. Vicki has 210 baseball cards and buys an additional 15 cards every week. Jeb has 275 baseball cards and buys an additional 10 cards every week. After how many weeks will Vicki and Jeb have the same number of baseball cards? **1 point**

- (A) 5 weeks
- (B) 10 weeks
- (C) 13 weeks
- (D) 15 weeks

30. Kurt begins with \$200 in his bank account and withdraws \$10 each week.

Part A

Write an equation for the line that represents this situation in slope-intercept form. **1 point**

$$y = -10x + 200$$

Part B

Graph the equation of the line.

