Unit 2 Test Study Guide
(Linear Functions & Systems)

Name: _____

Date: _____ **Block:** _____

Topic 1: Relations & Functions

Find the domain and range of each relation. Then determine if the relation is a function.

1.

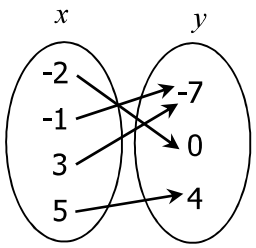
x	y
5	5
6	6
7	7
8	8

$D =$ _____

$R =$ _____

Function? _____

2.

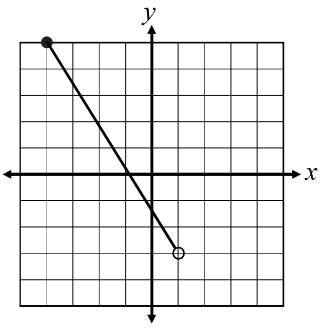


$D =$ _____

$R =$ _____

Function? _____

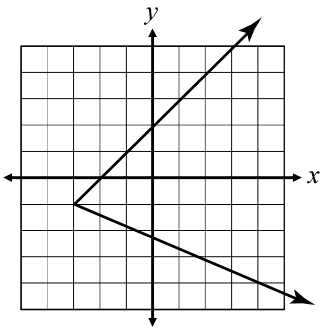
3.



$D =$ _____ $R =$ _____

Function? _____

4.



$D =$ _____ $R =$ _____

Function? _____

Use $f(x) = -4x + 1$, $g(x) = x^2 - 8x + 21$, and $h(x) = |9 - 3x|$ for questions 5 – 10.

5. Find $g(-5)$

6. Find $f\left(\frac{11}{12}\right)$

7. Find $h(8) - f(-7)$

8. Find $g(x + 4)$

9. If $f(x) = 53$, find x.

10. If $h(x) = 39$, find x.

Topic 2: Linear Equations: Slope-Intercept & Standard Form

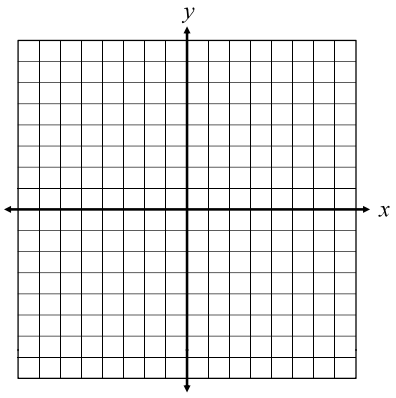
Write each equation in STANDARD FORM.

11. $y = -\frac{2}{3}x + 3$

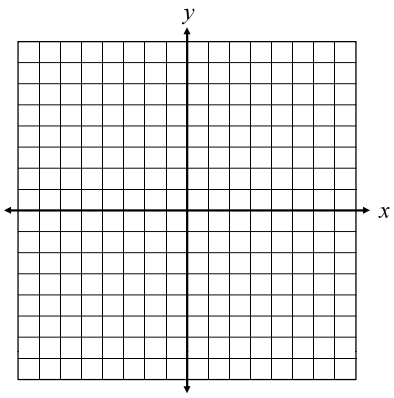
12. $\frac{5}{8}x + \frac{3}{4}y = -1$

Write each equation in SLOPE-INTERCEPT FORM, then graph the line.

13 $4x - 5y = -10$



14. $12x = 4y - 28$



Give an example of a line that is parallel and a line that is perpendicular to each given line.

15. $9x + 6y = -6$

Parallel: _____

Perpendicular: _____

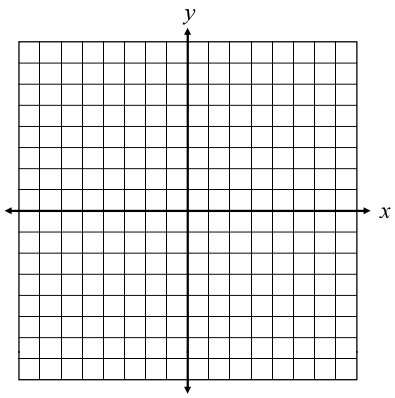
16. y = -5

Parallel: _____

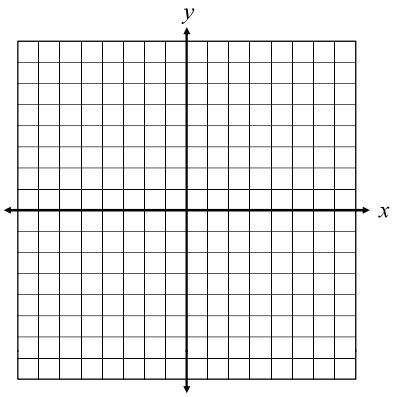
Perpendicular: _____

Find the x- and y-interepts of each line, then graph the line.

17. $y = -5x - 3$



18. $4y = 10x - 24$



Topic 3: Writing Linear Equations & Applications

Write the equation in SLOPE-INTERCEPT FORM with the given information.

19. Passes through (-8, 3) with a slope of -2

20. Passes through (-7, -3) and (5, 6)

DEFINE VARIABLES and WRITE EQUATIONS to represent the following situations, then solve.

21. For commission as a realtor, Michelle earns $349 plus 3% of the purchase price for each home she helps buy or sell. If she earned $8,965 in commission on a certain home, find its purchase price.

22. On Ryan's last social studies test, there were two types of questions: true/false worth 2 points each and multiple choice questions worth 4 points each. If Ryan earned 86 points on the test and answered 18 multiple choice questions correctly, how many true/false questions did he answer correctly?

23. The table below shows the altitude of a plane once it begins its descent to a runway.

Time *(minutes)*	***Altitude*** *(feet)*
0	28,500
1	26,378
2	24,105
3	21,774
4	19,452
5	17,991

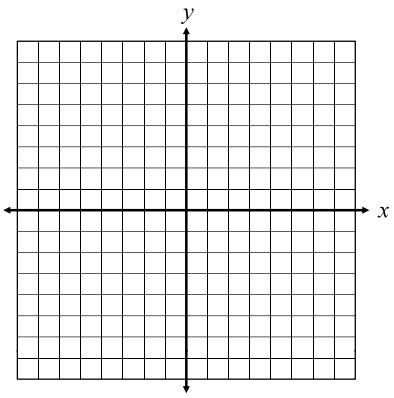
a) Write an equation to model the data using linear regression.

b) Find the height of the plane after 8 minutes.

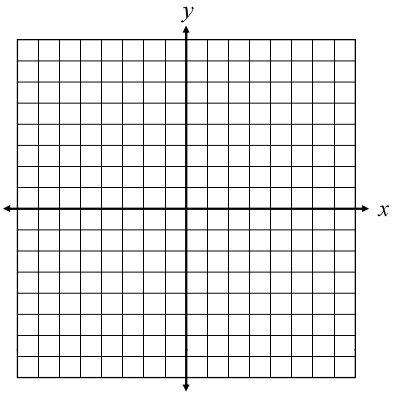
c) How long will it take the plane to land?

Topic 4: Systems of Equations

24. $x - 2y = 8$
$6x - y = -7$
(Solve by Graphing)



25. $3y - 6 = 4x$
$16x + 24 = 12y$
(Solve by Graphing)



26. $5x - 4y = 9$
$x + 7y = -6$
(Solve by Substitution)

27. $2x + 3y = -35$
$8x - y = -23$
(Solve by Substitution)

28. $3x + 10 = 14y$
$8x - 7y = 34$
(Solve by Elimination)

29. $18x = 12y + 7$
$-8y + 21 = -12x$
(Solve by Elimination)

30. Ben has a collection of quarters and nickels worth \$5.35. If the number of nickels is five less than twice the number of quarters, find the number of each coin.

31. Aliyah bought four composition notebooks and three packs of pencils from the school bookstore and paid $10.93. Laura bought seven composition notebooks and two packs of pencils and paid $13.31. If each pencil pack contains ten pencils, what is the unit price per pencil?

32. Solve the system below using your method of choice:

$4x + 2y - 5z = 47$

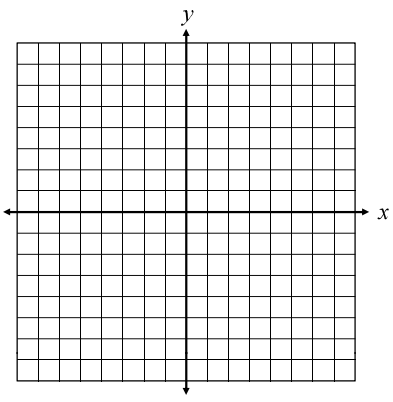
$x - 2y + 6z = -10$

$9x - 7y - z = 75$

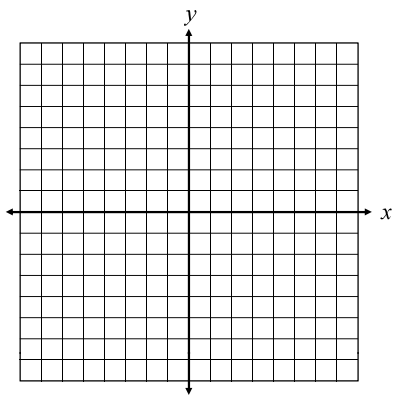
Topic 5: Linear Inequalities & Systems of Linear Inequalities

Show the solution to each linear inequality and system of linear inequalites by graphing.

33. $y > -\frac{7}{2}x + 3$

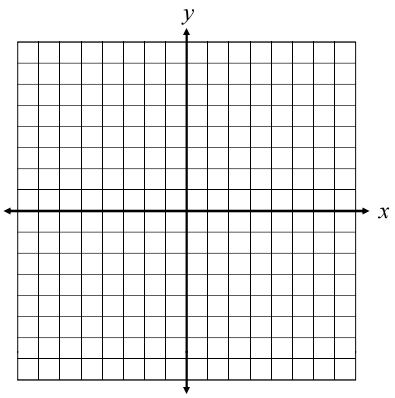


34. $2x - 6y \geq 36$



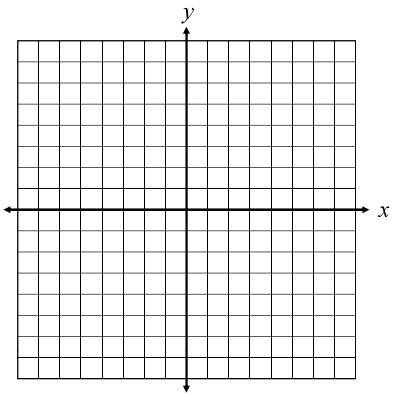
35. $5x - 2y > -8$

$y \leq -3$



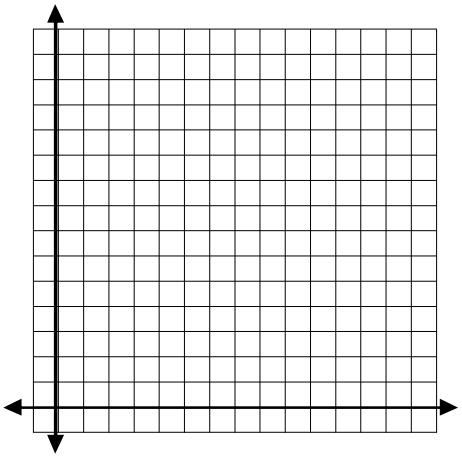
36. $x - y \leq 4$

$3y \geq 3x + 9$



37. As part of Kayla's exercise program, she either runs 6 miles/day or rides her bike 10 miles/day. Her new goal is to cover a minimum distance of 200 miles, with at least 15 of the days running. She would like to determine the number of days it would take to accomplish this.

a) Write a system of linear inequalities to represent this situation, then graph.



b) Using your graph, give two possible combinations of days Kayla can run and ride her bike to meet her goal.