Math 10 Linear Functions Canvas

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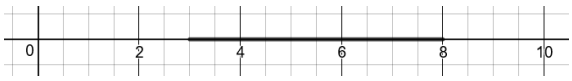
- Slope: positive, negative, zero, and undefined
- Types of equations and lines (point-slope, slope-intercept, and general)
- Equations of parallel and perpendicular lines
- Equations of horizontal and vertical lines
- Connections between representations: graphs, tables, equations

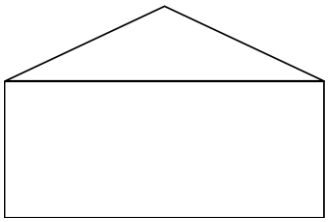
1. How long is the line segment below?



2. $A(2, -4)$ and $B(6, 4)$. Slope?

3. Points $\left(2, \frac{2}{3}\right)$ and $\left(-3, -2\frac{1}{2}\right)$. Slope?

4. Estimate the positive slope of the house roof below:



5. Points $(3, 5)$ and $(k, 19)$. Given the slope of this line segment is -2, find k.

6. $y = 3x - 2$. Slope?

7. $y = 5x - 2$. y-intercept?

8. $y = \frac{x}{2} + 4$. x-intercept?

9. $y = \pi x - 3$. Find the value of the slope.

10. $y = 0.5x + 2$. If the rise portion of the slope is 4, find the run.

11. $y = -1$. Slope?

12. $x = y$. If possible, find the value of the slope.

13. $x = 1$. If possible, find the value of the slope.

14. $x = 3$. In what quadrants is this line?

15. $y = 3x - 2$. In what quadrants is this line?

16. In what quadrants is $y = 3 - \frac{x}{2}$?

17. In what quadrants is $y = \frac{2}{-3}x - 0.5$?

18. $y = 3x + 4$. Find the coordinates of the y-intercept in the form (a, b).

19. $f(x) = 5x - 3$. Evaluate $f(4)$.

20. $f(x) = 5x - 3$. Given $f(x) = 52$, find x.

21. $y = 3x + 2$. Is the point $(7, 15)$ on this line?

22. $y = 3x + 2$. Is the point $(-5, -13)$ on this line?

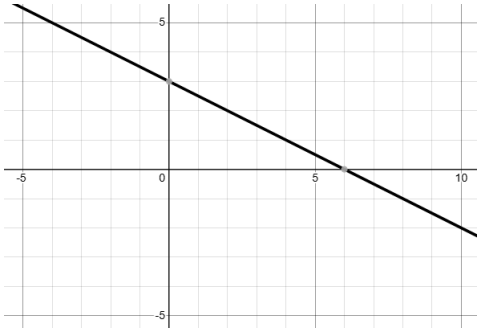
23. A line has an x-intercept of 4 and goes through the point $(1, 2)$.
Find the equation of this line in slope-intercept form.

24. A line goes through the points $(2, 3)$ and $(7, -1)$.
Find the equation of this line in slope-intercept form.

25. What information is enough by itself to determine the equation of a line?
Choose MORE than one answer below:

A point and the slope
Just the slope
One point
Two points
The x-intercept
The y-intercept

26. The equation of the line below can be written as: $y - 0 = -\frac{1}{2}(x + k)$.
Find k.



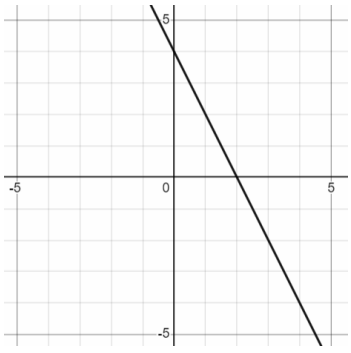
27. $\frac{2}{3}y - \frac{3}{4}x = \frac{1}{2}$
Find the equation of this line in general form: $Ax + By + C = 0, A > 0$.

28. $\frac{2}{3}x + \frac{y}{2} = 5$. Find the value of the x-intercept.

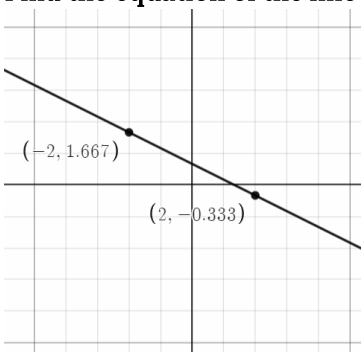
29. $\frac{2}{3}x + \frac{y}{2} = 5$. Find the value of the y-intercept.

30. True or False: $y = -0.\overline{6}x + \frac{1}{5}$ is the same line as $0 = 10x + 15y - 3$.

31. Find the equation of the line below in the form $y = mx + b$.



32. Find the equation of the line below in the form $y = mx + b$.



33. A line contains the points $(1, 2)$ and $(5, 0)$.
These points are on which of the following lines?

$y - 0 = -\frac{1}{2}(x - 5)$

$y - 2 = -\frac{1}{2}(x - 1)$

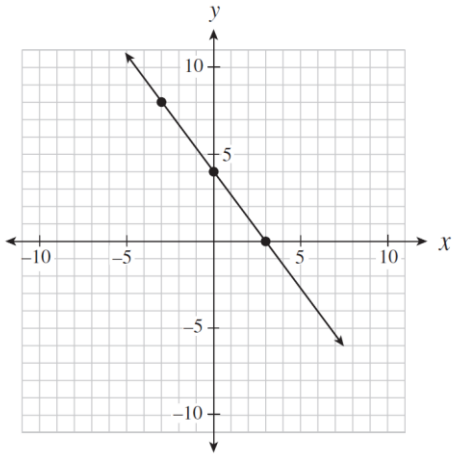
$y = -\frac{1}{2}x + \frac{5}{2}$

$y + 2 = -\frac{1}{2}(x - 9)$

34. The line $2x + \frac{1}{2} = \frac{y}{3}$ is in which quadrants?

35. Write $2x + \frac{1}{2} = \frac{y}{3}$ in standard form: $Ax + By = C$, where $A > 0$

36. See graph below:



Which of the following equations describes the linear relation graphed above?
Choose MORE than one answer.

I. $y = \frac{4}{3}x + 4$

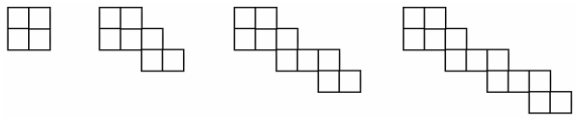
II. $y - 8 = -\frac{4}{3}(x + 3)$

III. $4x + 3y - 12 = 0$

37. Consider the pattern $11, 7, 3, -1, \ldots$ Represent this pattern in the form $y = mx + b$.

38. Consider the pattern $11, 7, 3, -1$. Find the 1000th number.

39. See diagram below.
How many squares are in figure 43?



40. Does the following table of values represent points on a line?

x	y
0	2
1	5
2	8
4	11

41. Does the following table of values represent points on a line?

x	y
-2	-4
-1	-1
0	2
2.5	19/2

42. The following table of values represents a line.
Find the missing value below:

x	y
-2	3
2	15
5	?

43. Money is a function of time in hours: $M(t) = 20t + 50$.
How much do you get paid if you work for 8 hours?

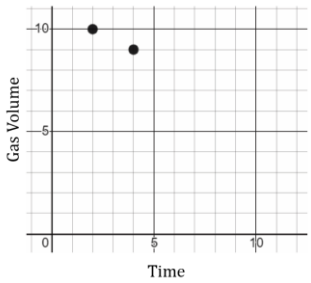
44. Money is a function of time in hours: $M(t) = 20t + 50$.
How many hours do you have to work to earn $280?

45. True or False: $y = 4x - 3$ is parallel to $2y - 8x = 1$.

46. Find the equation of a line that is parallel to $y = 3x - 2$ and goes through the point $(3, 2)$ in the form $y = mx \pm b$.

47. Find the equation of a line that is perpendicular to $y = -\frac{x}{3} + 1$ and has an x-intercept of 2.
Answer in the form $y = mx \pm b$.

48. See the gas – time graph below.
When do you run out of gas?

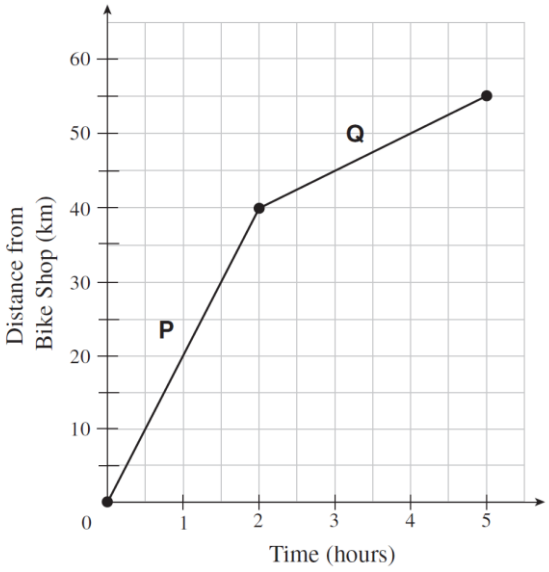


49. A hot-dog vendor makes a profit of $100 when he sells 90 hot dogs a day. He has a loss of $30 when he sells 25 hot dogs a day. How many hot dogs does he need to sell to break even (neither lose nor make money)?

50. Given the equation $Ax + By + C = 0$, which of the following conditions must be true for the graph of the line to have a positive slope and a positive y-intercept?

A. $A > 0, B > 0, C > 0$
B. $A > 0, B < 0, C > 0$
C. $A > 0, B > 0, C > 0$
D. $A > 0, B < 0, C < 0$

51. The graph below models a bicycle's distance from a bike shop over time. Calculate the change in the speed of the bike from segment P to segment Q.



52. Two isosceles triangles have the same height. The slopes of the sides of triangle A are double the slopes of the corresponding sides of triangle B. How do the lengths of their bases compare?