

# BLC150–Algebra Workshop

## Sample Quiz 2

$$y = mx + b$$

$m = \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{y_1 - y_2}{x_1 - x_2}$ . The input data is from two points,  $(x_1, y_1)$  and  $(x_2, y_2)$ .

$b = y_{\text{intercept}}$  which is where the line crosses the y-axis. It is the point  $(0, y)$ .

$x_{\text{intercept}}$ . Just set  $y = 0$  in the " $y = mx + b$ " form and solve for  $x$ . It's the point  $(x, 0)$ .

Perpendicular slopes relate to one another like so:  $m \perp \frac{-1}{m}$  or  $\frac{a}{b} \perp \frac{-b}{a}$ .


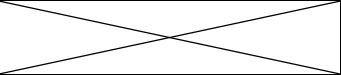
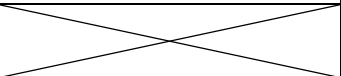
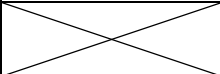
Take a slope... flip it... add a negative sign. They will be perpendicular.

Parallel slopes are equal to one another:  $m_1 = m_2$ .

Fill in the chart with the appropriate information derived from the given information.

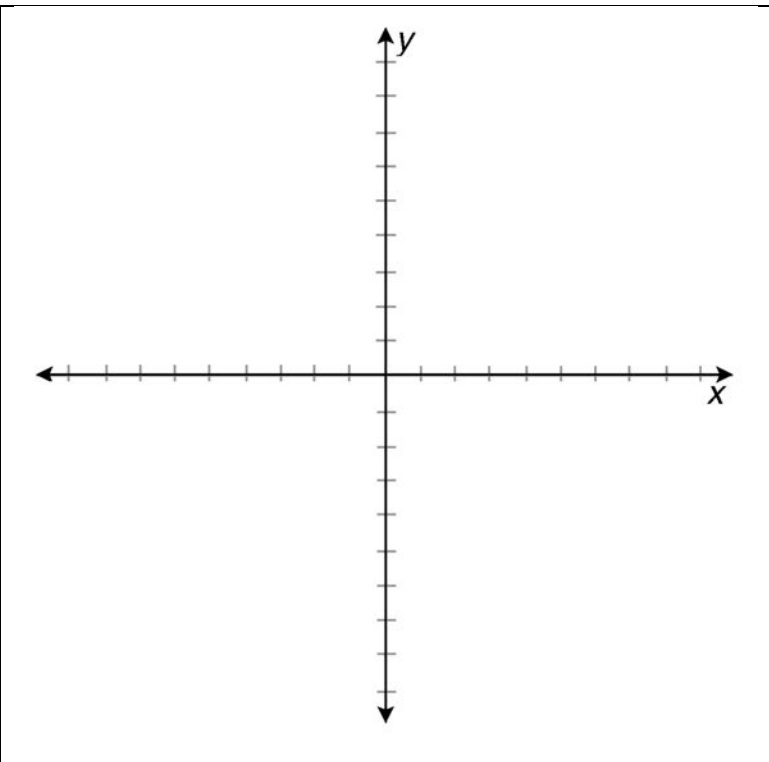
Some boxes have been "x-ed" out... no need to fill those in.

When you are unsure what is happening, make a quick graph of what you know.

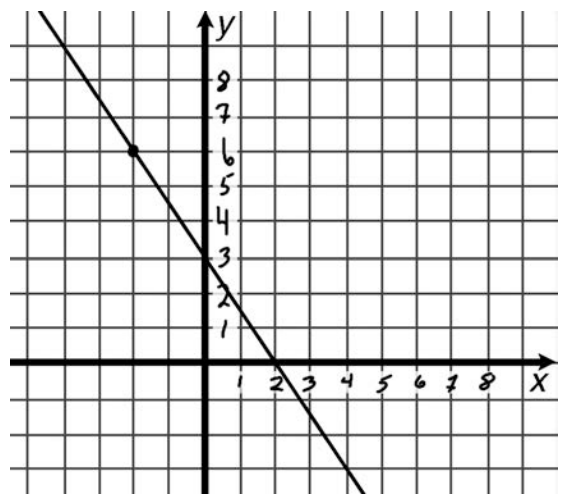
	1 or 2 given points	$m$	$b$	$y = mx + b$	$x\text{-intercept}$
1				$y = 3x + 9$	
2		$2/3$	$(0, -2)$		
3	$(2, 1)$	$3/2$			
4	$(1, -2)$ and $(-2, 3)$		$(0, -1/3)$		$(-1/5, 0)$
5		$-3/2$	$(0, 2)$		
6	$(2, 2)$ and $(-3, 2)$				
7	$(0, 0)$	$1$			
8	$(-1, 3)$ and $(-1, -2)$				
9	$(1.1, 3.3)$ and $(-1.3, 2.1)$				
10	$(-0.5, -4)$	$8$			
11	$(-4/3, 3)$ and $(-1/2, -5)$				
12	$(22, 18)$	$-12$			

13. Identify the two pairs of lines which are perpendicular to one another?
14. Which is a horizontal line?
15. Which is a vertical line?
16. Write the equation for the  $x$ -axis in  $y = mx + b$  form.
17. Write the equation for a line parallel to the  $x$ -axis but intersecting the  $y$ -axis at 3.
18. Write the equation for a line parallel to the  $x$ -axis intersecting the  $y$ -axis at -2.

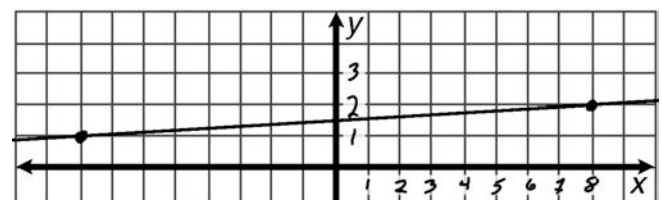
19. Graph #10 from the above problems.
20. Now graph a line, perpendicular to the line from #10 and passing through the point (1, 1).
21. What is the slope of this perpendicular line?
22. Write the equation of this perpendicular line.



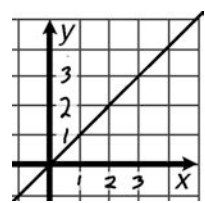
23. Write an equation for this line in  $y = mx + b$  form.



24. Write an equation for this line...



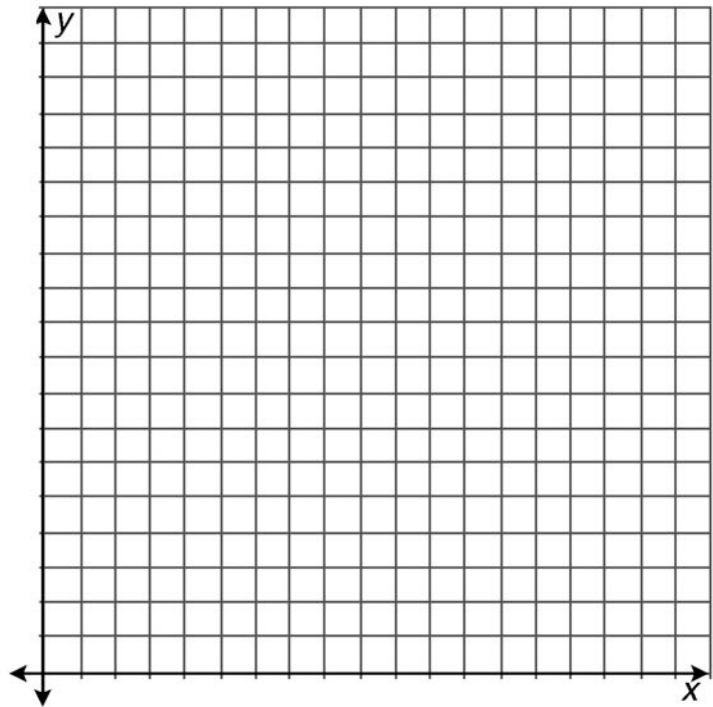
25. Write an equation for this line...



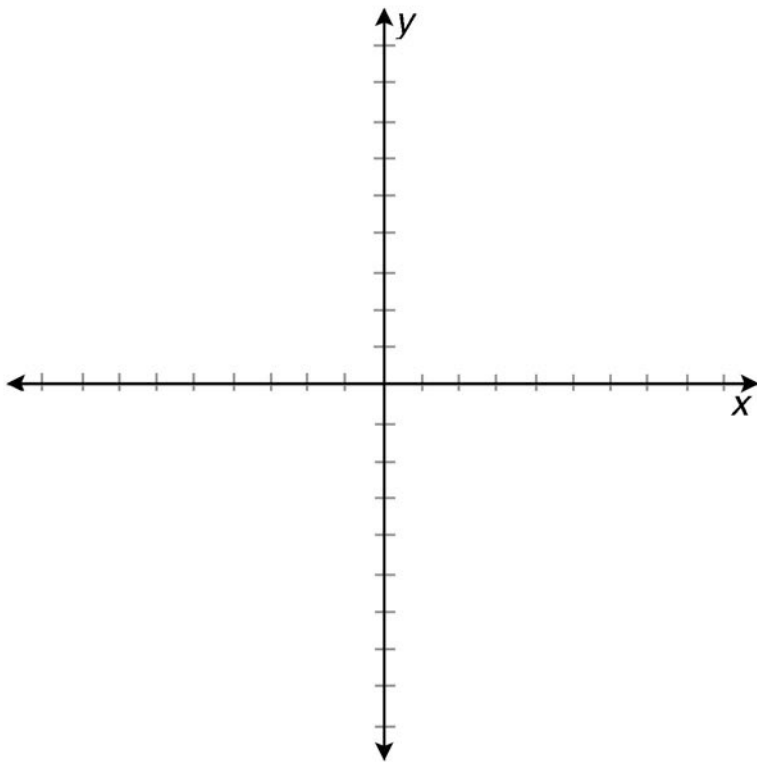
26. You need to rent a van from U-Haul. The \$19.95 special looks enticing, but in addition to the \$19.95 you must pay \$0.59 per mile. Write a formula in the  $y = mx + b$  form that describes this situation, where  $y$  is the total you would spend and the  $x$  would be miles you drive.

27. Graph your equation from #26.

28. How much will it cost to rent a van and then drive it for 122 miles?



Remember to put numbers on this graph.



Put numbers on this graph.

Graph the following by finding the *y*-intercept (what  $y$  equals when  $x$  is  $0$ ) and by plotting a few points. In addition to plugging in  $0$  for  $x$ , I'd suggest plotting  $1$ ,  $-1$ ,  $2$ , and  $-2$ . That will give you the general character of these curves.

29. Graph  $y = x^2$ .

30. Graph  $y = -x^2$

31. Graph  $y = x^2 - 3$

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

33. Graph  $y = x^2 - 5$

34. Graph  $y = -x^2 + 5$

35. Graph  $y = 0.25x^2 + 3$

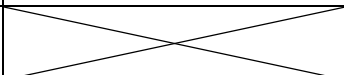
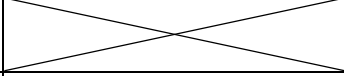

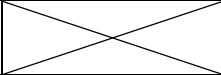
36. Graph  $y = -0.25x^2 - 3$

## Solutions to the Sample Quiz 2.

Fill in the chart with the appropriate information derived from the given information.

Some boxes have been "x-ed" out... no need to fill those in.

When you are unsure what is happening, make a quick graph of what you know.

	<b>1 or 2 given points</b>	<b><math>m</math></b>	<b><math>b</math></b>	<b><math>y = mx + b</math></b>	<b><math>x</math>-intercept</b>
1		3	(0, 9)	$y = 3x + 9$	(-3, 0)
2		$\frac{2}{3}$	(0, -2)	$y = (\frac{2}{3})x - 2$	(3, 0)
3	(2, 1)	$\frac{3}{2}$	(0, -2)	$y = (\frac{3}{2})x - 2$	( $\frac{4}{3}$ , 0)
4	(1, -2) and (-2, 3)	$-\frac{5}{3}$	(0, -1/3)	$y = (-\frac{5}{3})x - \frac{1}{3}$	(-1/5, 0)
5		$-\frac{3}{2}$	(0, 2)	$y = (-\frac{3}{2})x + 2$	( $\frac{4}{3}$ , 0)
6	(2, 2) and (-3, 2)	0	(0, 2)	$y = 2$	
7	(0, 0)	1	(0, 0)	$y = x$	(0, 0)
8	(-1, 3) and (-1, -2)	$\frac{5}{0}$ und. or $\infty$	n.a.	$x = -1$	(-1, 0)
9	(1.1, 3.3) and (-1.3, 2.1)	$\frac{1}{2}$	(0, 2.75)	$y = (\frac{1}{2})x + 2.75$	(-5.5, 0)
10	(-0.5, -4)	8	(0, 0)	$y = 8x$	(0, 0)
11	(-4/3, 3) and (-1/2, -5)	-9.6	(0, -9.8)	$y = -9.6x - 9.8$	(-1.0208 $\bar{3}$ , 0)
12	(22, 18)	-12	(0, 282)	$y = -12x + 282$	(23.5, 0)

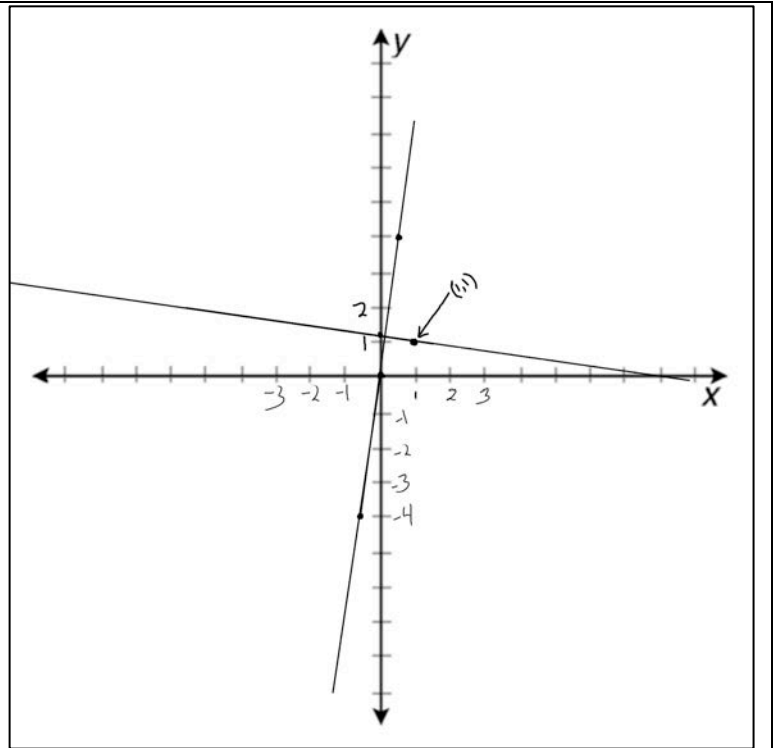
13. Identify the two pairs of lines which are perpendicular to one another? #2 and #5 AND #6 and #8
14. Which is a horizontal line? #6.
15. Which is a vertical line? #8.
16. Write the equation for the  $x$ -axis in  $y = mx + b$  form.  $y = 0$
17. Write the equation for a line parallel to the  $x$ -axis but intersecting the  $y$ -axis at 3.  $y = 3$ .
18. Write the equation for a line parallel to the  $x$ -axis intersecting the  $y$ -axis at -2.  $y = -2$

19. Graph #10 from the above problems.

20. Now graph a line, perpendicular to the line from #10 and passing through the point (1, 1).

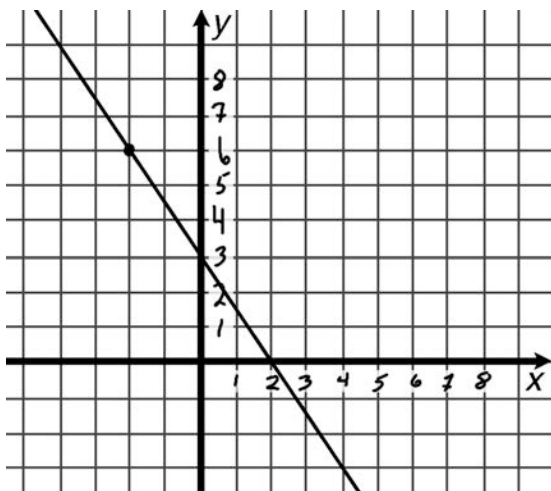
21. What is the slope of this perpendicular line?  $m = -1/8$

22. Write the equation of this perpendicular line.  $y = (-1/8)x + 9/8$



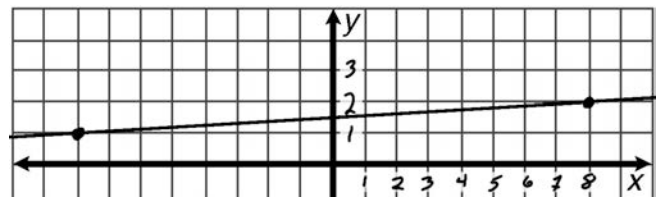
23. Write an equation for this line in  $y = mx + b$  form.

$$y = (-3/2)x + 3$$

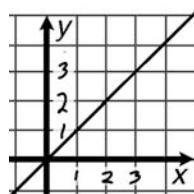


24. Write an equation for this line...

$$y = 16x + 1.5$$



25. Write an equation for this line...  $y = x$



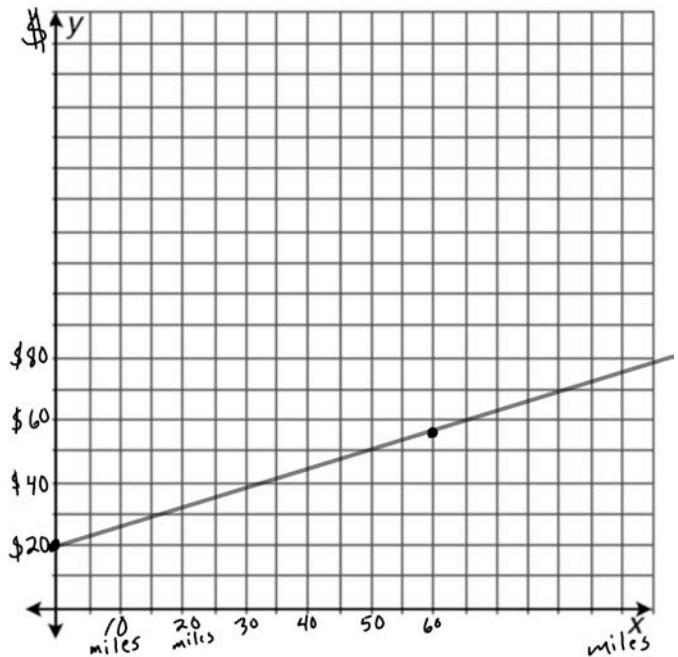
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$$y = \$0.59x + \$19.95$$

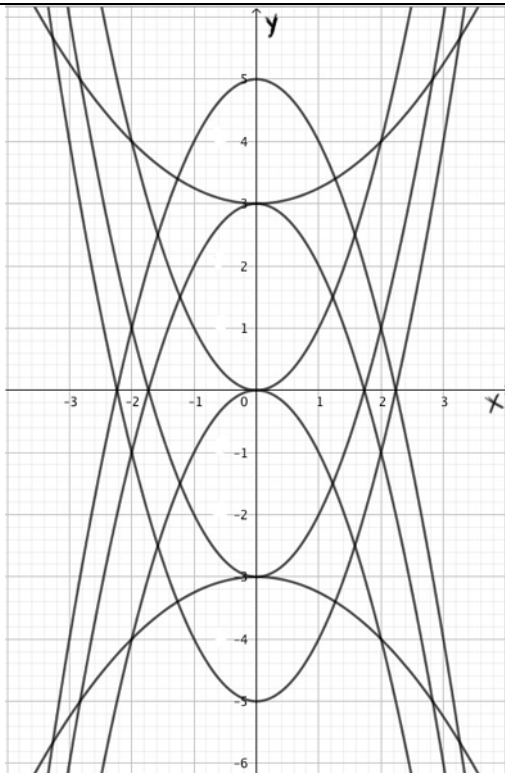
27. Graph your equation from #26.

28. How much will it cost to rent a van and then drive it for 122 miles?

$$\$91.93$$



Remember to put numbers on this graph.



Put numbers on this graph.

Graph the following by finding the  $y$ -intercept (what  $y$  equals when  $x$  is  $0$ ) and by plotting a few points. In addition to plugging in  $0$  for  $x$ , I'd suggest plotting  $1$ ,  $-1$ ,  $2$ , and  $-2$ . That will give you the general character of these curves.

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