

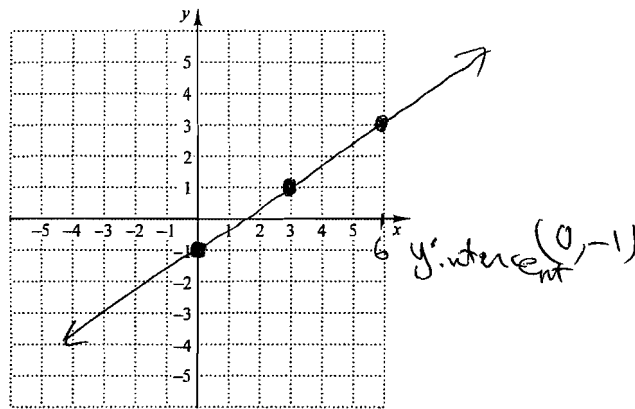
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6. $f(x) = \frac{2}{3}x - 1$

6. _____

x	y
0	-1
3	1
6	$\frac{2}{3} \cdot 6 - 1 = 3$



Determine the y-intercept.

7. $y = -2x + 5$

(0, 5)

7. _____

8. $g(x) = 4.1x - 17$

(0, -17)

8. _____

For each pair of points, find the slope of the line containing them.

9. (-2, 3) and (1, 6)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 3}{1 - (-2)} = \frac{3}{3} = 1$$

9. _____

10. (-2, -1) and (-5, -1)

$$m = \frac{-1 - (-1)}{-5 - (-2)} = \frac{0}{-3} = 0$$

10. _____

11. $(\frac{1}{2}, -\frac{2}{3})$ and $(\frac{4}{5}, -\frac{3}{2})$

$$\frac{(-\frac{2}{3} - (-\frac{3}{2}))}{(\frac{4}{5} - \frac{1}{2})} =$$

11. $-\frac{11}{3}$

12. (-2.3, -4.6) and (-1.3, -4.1)

$$\frac{-4.1 - (-4.6)}{-1.3 - (-2.3)} = \frac{1}{2}$$

12. $\frac{1}{2}$

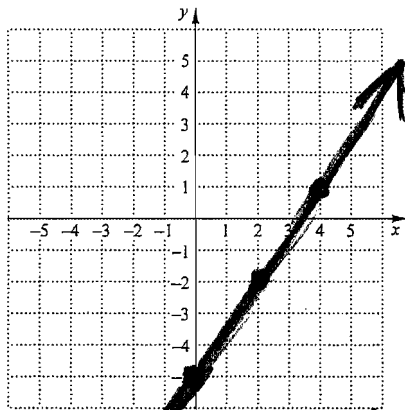
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Determine the slope and the y-intercept. Then draw a graph. Check using a third point.

13. $g(x) = \frac{3}{2}x - 5$

13. _____



x	y
0	-5
2	$3 - 5 = -2$
4	$\frac{3}{2}(4) - 5 = 6 - 5 = 1$

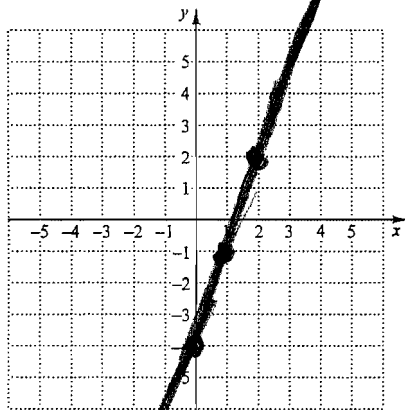
14. $3x - y = 4$

14. _____

$-y = -3x + 4$

$y = 3x - 4$

x	y
0	-4
+1	-1
2	2



15. $4x + 3y = 6$

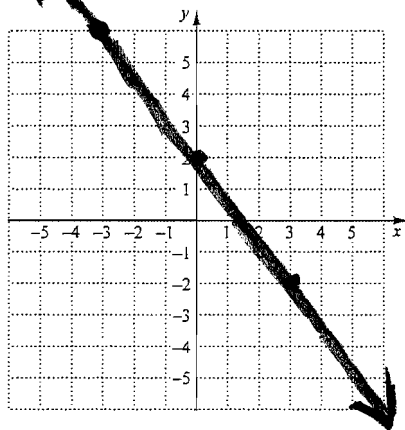
15. _____

$3y = -4x + 6$

$y = -\frac{4}{3}x + \frac{6}{3}$

$y = -\frac{4}{3}x + 2$

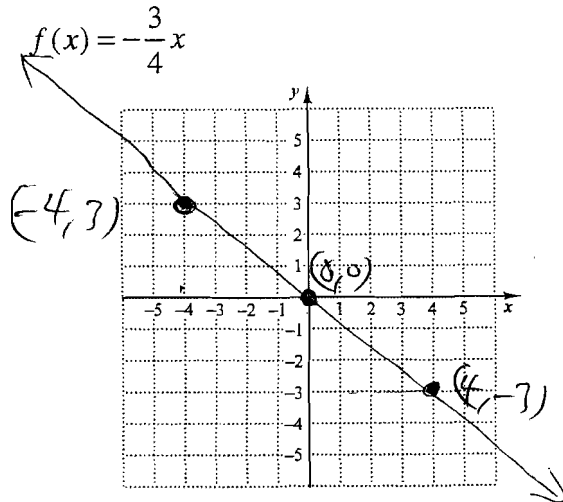
x	y
0	2
3	-2
-3	6



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16.



16. _____

x	y
0	0
4	-3
-4	3

Find a linear function whose graph has the given slope and y-intercept.

17. Slope $\frac{2}{9}$; y-intercept (0,6)

17. _____

$$y = \frac{2}{9}x + 6$$

$$f(x) = \frac{2}{9}x + 6$$

18. Slope -3; y-intercept (0,-4)

18. $f(x) = -3x - 4$

$$y = mx + b = -3x - 4$$

19. Slope $-\frac{3}{5}$; y-intercept $(0, -\frac{1}{4})$

19. $f(x) = -\frac{3}{5}x - \frac{1}{4}$

20. Slope 5; y-intercept $(0, \frac{2}{5})$

20. $f(x) = 5x + \frac{2}{5}$

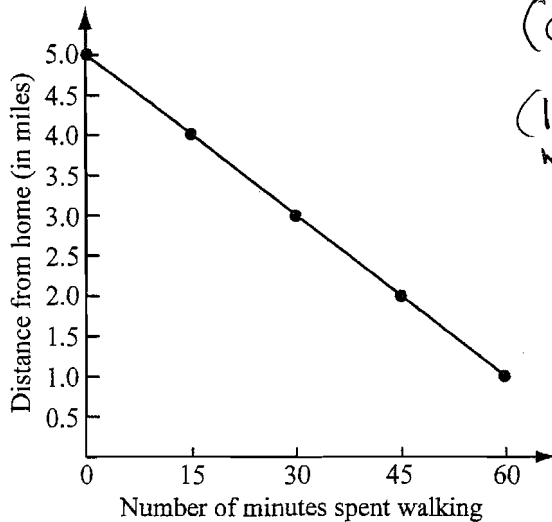
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For each graph, find the rate of change. Remember to use appropriate units.

21.

21. _____



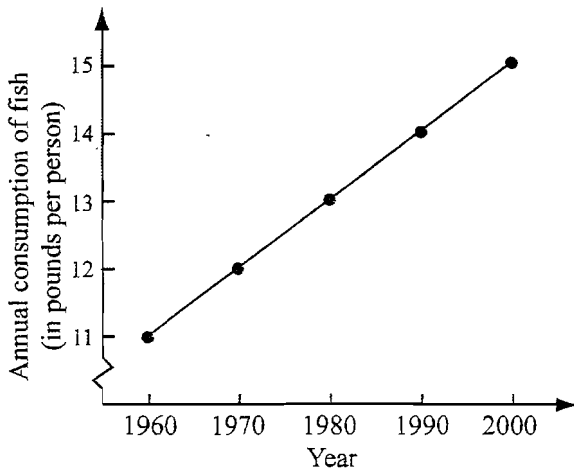
$(0, 5)$
 $(15, 4)$
min mile

$$m = \frac{4 - 5}{15 - 0}$$

$$m = \frac{-1 \text{ mile}}{15 \text{ min}}$$

22.

22. _____



Source: Based on data from the National Marine Fisheries Service

$(1960, 11)$

$(1970, 12)$

$$m = \frac{12 - 11}{1970 - 1960} = \frac{1 \text{ pounds per person}}{10 \text{ year}}$$

Find the rate.

23. A plane begins to descend to sea level from 20,000 ft after being airborne for 1 hr 40 min. The entire flight time is $2\frac{1}{2}$ hr. Determine the average rate of descent of the plane.

23. _____

$$400 \text{ ft/min}$$

Descending

$$\begin{aligned} & (100 \text{ min}, 20000) \\ & (150 \text{ min}, 0) \end{aligned} \Rightarrow m = \frac{0 - 20000}{150 - 100} = \frac{-20000}{50} = -400 \frac{\text{ft}}{\text{min}}$$

$$3 \text{ min} * \frac{1 \text{ HR}}{60 \text{ min}} = \frac{3}{60} \text{ HR} = \frac{1}{20} \text{ HR}$$

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24. Rachel walked 360 steps on an elliptical trainer after 3 min and reached 1800 steps 12 min later. Assuming a constant rate, find Rachel's rate, in steps per hour.

$$24. \frac{9600 \text{ steps}}{\text{HR}}$$

$$\left(\frac{1}{20}, 360 \text{ steps}\right) \quad \left(\frac{12}{60}, 1800\right)$$

In Exercises 25 and 26, each model is of the form $f(x) = mx + b$. In each case, determine what m and b signify.

25. The cost, in dollars, of one month of Andrew's cell phone service is given by $c(x) = 0.1x + 39.95$, where x is the number of text messages sent and received.

$$25. m = 0.1$$

$$b = 39.95$$

The initial cost is \$39.95 and Andrew pays 10 cents per message

26. The amount, in dollars, that Chad owes on his school loan is given by $s(t) = -500t + 6000$, where t is the number of months after he has graduated.

$$26. \underline{\hspace{2cm}}$$

$$m = -500$$

$$b = 6000$$

Chad had \$6000 student loan and every month he pays off \$500 of it.

27. Perfect Printing uses the function given by $P(t) = -400t + 2500$ to determine the salvage value $P(t)$, in dollars, of a printer t years after it has been put into use.
- What do the numbers -400 and 2500 signify?
 - How long will it take the printer to depreciate completely?
 - What is the domain of P ?

$$27. (a) \underline{\hspace{2cm}} \quad b = \text{the original value was } \$2500$$

$$m = -400 \text{ depreciates } \$400 \text{ per year}$$

$$(b) \underline{0 = -400t + 2500} \quad t = 6.25$$

$$(c) \underline{[0, 6.25]}$$

28. The trade-in value of a boat can be determined using the function given by $v(n) = -250n + 5000$. Here $v(n)$ is the trade-in value, in dollars, after n summers of use.
- What do the numbers -250 and 5000 signify?
 - When will the value of the boat be \$2000?
 - What is the domain of v ?

$$28. (a) \underline{\hspace{2cm}} \quad \$5000 \text{ is the initial value of the boat}$$

$$-250 \text{ is how much the boat depreciates}$$

$$(b) \underline{2000 = -250n + 5000} \quad n = 12 \text{ uses}$$

$$(c) \underline{\hspace{2cm}} \quad 0 \leq n \leq 20$$

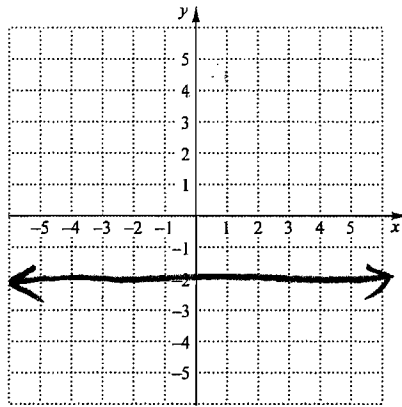
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Graph.

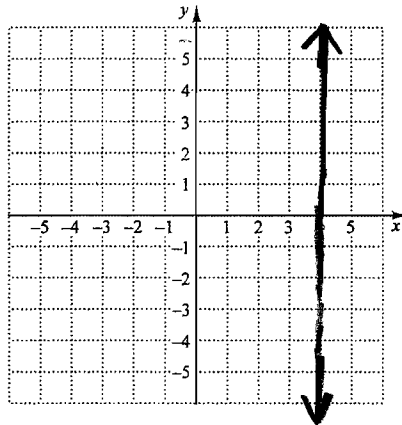
11. $y = -2$

11. _____



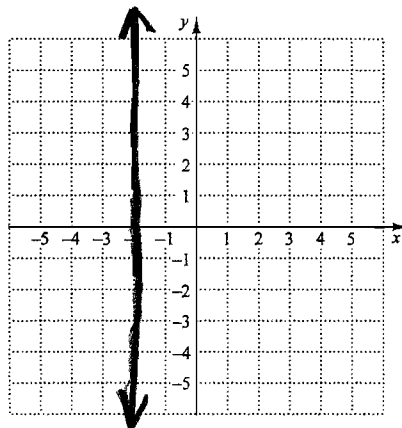
12. $x = 4$

12. _____



13. $5x = -10$

13. _____



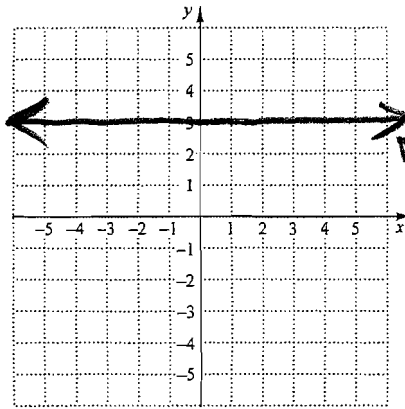
$5x = -10$
 $x = -2$

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14. $3 \cdot f(x) - 5x = 9 - 5x$

14. _____

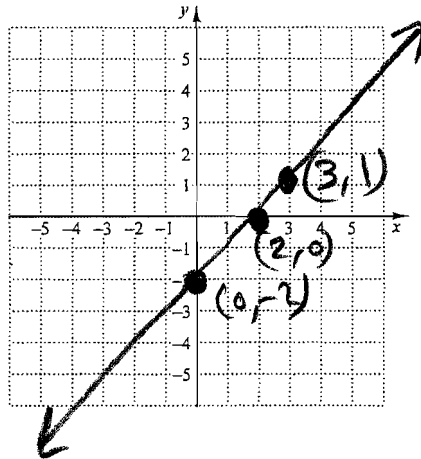


$3f(x) = 9$
 $f(x) = 3$
 $y = 3$

Find the intercepts. Then graph by using the intercepts, if possible, and a third point as a check.

15. $x - y = 2$

15. _____

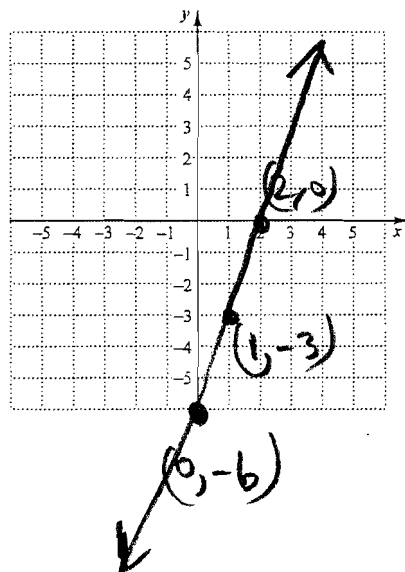


x	y
0	-2
2	0

(0, -2) y-intercept
(2, 0) x-intercept
(3, 1)

16. $y = 3x - 6$

16. _____



x-intercept (2, 0)

y-intercept (0, -6)

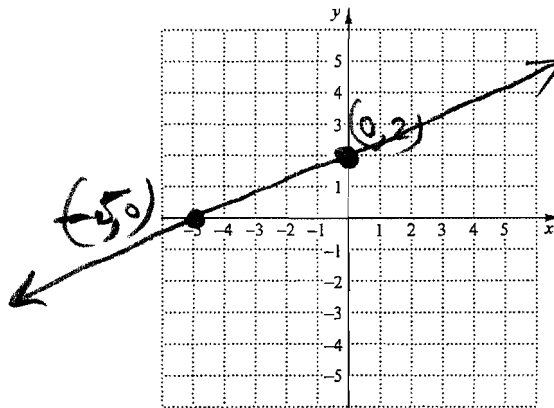
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17. $2x - 5y = -10$

17. _____

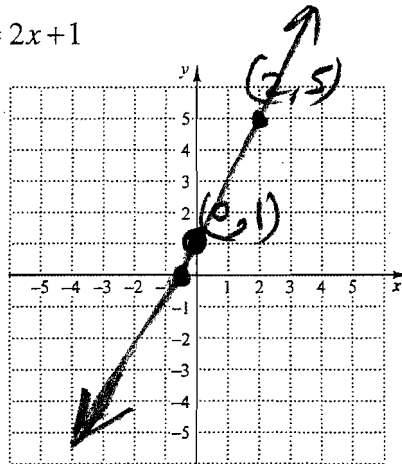
x	y
0	2
-5	0



18. $g(x) = 2x + 1$

18. _____

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



For each function, determine which of the given viewing windows will show both intercepts.

19. $f(x) = -15x + 50$

19. _____

- a) $[-10, 10, -10, 10]$ **b) $[-5, 5, -20, 80]$**
 c) $[-60, 60, -10, 10]$ d) $[-10, 0, 0, 100]$

20. $g(x) = 0.2x + 40$

20. _____

- a) $[-10, 10, -10, 10]$ b) $[-50, 50, -200, 400]$
 c) $[-5, 5, -50, 50]$ **d) $[-500, 500, -50, 50]$**

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Without graphing, tell whether the graphs of each pair of equations are parallel.

21. $y = 3 - 2x$, $y = -2x + 3$ $(m = -2)$ 21. NO
 $y - 2x = 5$
 $y = 2x + 5$ $(m = 2)$

22. $x - y = -2$, $\Rightarrow -y = -x - 2$ 22. Yes these lines are parallel
 $5 + x = y$
 $y = x + 2 \Rightarrow (m = 1)$
 $y = x + 5$ $(m = 1)$

Without graphing, tell whether the graphs of each pair of equations are perpendicular.

23. $f(x) = 2x - 1$, $(m = 2)$ 23. Yes These lines are perpendicular
 $x + 2y = 3$
 $2y = -x + 3$

24. $x + 3y = 3$, $y = \frac{1}{2}x + \frac{3}{2}$ $(m = \frac{1}{2})$ 24. NO
 $2x = 6y - 1$
 $3y = -x + 3 \Rightarrow y = -\frac{1}{3}x + 1$ $(m = -\frac{1}{3})$
 $6y = 2x + 1$
 $y = \frac{2}{6}x + \frac{1}{6} = \frac{1}{3}x + \frac{1}{6}$ $(m = \frac{1}{3})$

Write an equation for a linear function parallel to the given line with the given y-intercept.

25. $y = -2x + 1$; $(0, -3)$ 25. $y = -2x - 3$

$$y = m x + b$$

\downarrow

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

26. $2x - 4y = 5$; $(0, 1)$ 26. $y = \frac{1}{2}x + 1$

$$-4y = -2x + 5$$
$$y = \frac{1}{2}x - \frac{5}{4}$$

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Write an equation for a linear function perpendicular to the given line with the given y-intercept.

27. $y = 3x - 5$; $(0, 2)$

27. _____

$$m_{\perp} = -\frac{1}{3} \implies y = -\frac{1}{3}x + 2$$

28. $3y + 2x = 7$; $(0, -4)$

28. $y = \frac{3}{2}x - 4$

$$3y = -2x + 7$$

$$y = -\frac{2}{3}x + \frac{7}{3} \quad m_{\perp} = \frac{3}{2}$$

Determine whether each equation is linear. Find the slope of any nonvertical lines.

29. $2x - 5y - 3 = 0$

29. $m = \frac{2}{5}$
Linear

$$5y = 2x - 3$$

$$y = \frac{2}{5}x - \frac{3}{5}$$

30. $7(x - 4) = 2 - 3y$

30. Linear $m = -\frac{7}{3}$

$$7x - 28 = 2 - 3y$$

$$-3y = 7x - 30$$

$$y = -\frac{7}{3}x + 10$$

31. $\frac{f(x)}{3} = x - 6$

31. $f(x) = 3x - 18$ Linear
 $m = 3$

32. $g(x) = \frac{1}{x}$

32. Not linear