

3-1 Graphing Linear Equations

Determine whether each equation is a linear equation. Write *yes* or *no*. If yes, write the equation in standard form.

13. $5x + y^2 = 25$

ANSWER:

no

14. $8 + y = 4x$

ANSWER:

yes; $4x - y = 8$

15. $9xy - 6x = 7$

ANSWER:

no

16. $4y^2 + 9 = -4$

ANSWER:

no

17. $12x = 7y - 10y$

ANSWER:

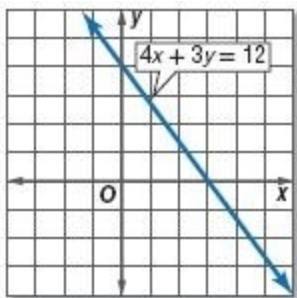
yes; $4x + y = 0$

18. $y = 4x + x$

ANSWER:

yes; $5x - y = 0$

Find the x - and y -intercepts of the graph of each linear function.



19.

ANSWER:

3, 4

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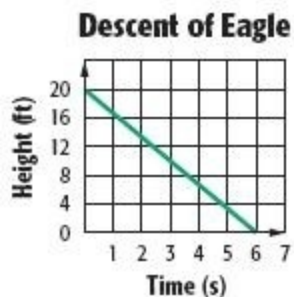
x	y
-3	-1
-2	0
-1	1
0	2
1	3

20.

ANSWER:

-2, 2

Find the x - and y -intercepts of each linear function. Describe what the intercepts mean.



21.

ANSWER:

6, 20; The x -intercept represents the number of seconds that it takes the Eagle to land. The y -intercept represents the initial height of the eagle.

Eva's Distance from Home	
Time (min)	Distance (mi)
x	y
0	4
2	3
4	2
6	1
8	0

22.

ANSWER:

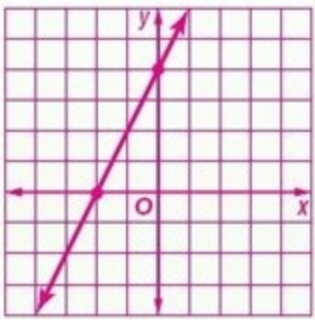
8, 4; The x -intercept 8 means that it took Eva 8 minutes to get home. The y -intercept 4 means that Eva was initially 4 miles from home.

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Graph each equation by using the x - and y -intercepts.

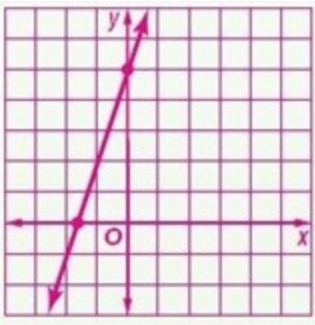
23. $y = 4 + 2x$

ANSWER:



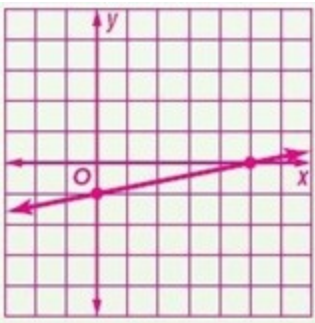
24. $5 - y = -3x$

ANSWER:



25. $x = 5y + 5$

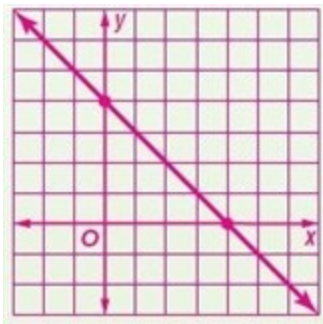
ANSWER:



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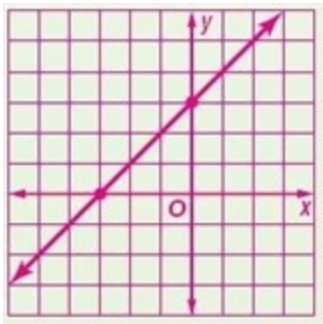
26. $x + y = 4$

ANSWER:



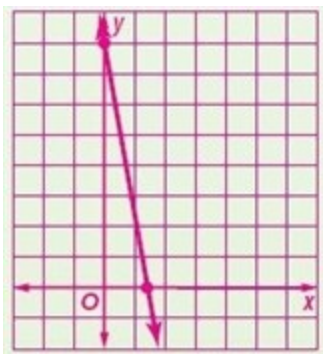
27. $x - y = -3$

ANSWER:



28. $y = 8 - 6x$

ANSWER:



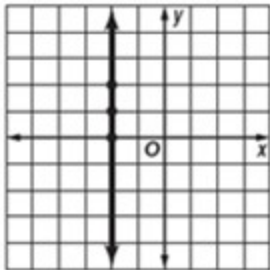
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Graph each equation by making a table.

29. $x = -2$

ANSWER:

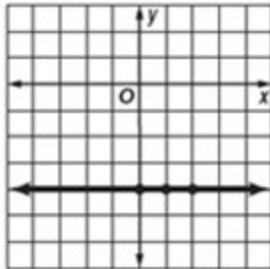
x	y
-2	0
-2	1
-2	2



30. $y = -4$

ANSWER:

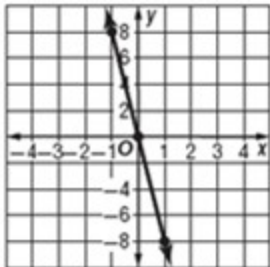
x	y
0	-4
1	-4
2	-4



31. $y = -8x$

ANSWER:

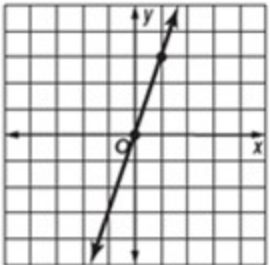
x	y
-1	8
0	0
1	-8



32. $3x = y$

ANSWER:

x	y
0	0
1	3
2	6

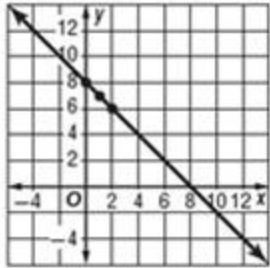


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33. $y - 8 = -x$

ANSWER:

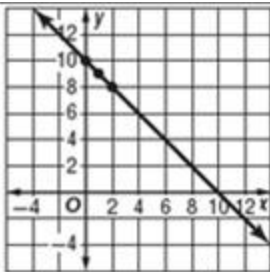
x	$y = -x + 8$	y	(x, y)
0	$y = -(0) + 8$	8	(0, 8)
1	$y = -(1) + 8$	7	(1, 7)
2	$y = -(2) + 8$	6	(2, 6)



34. $x = 10 - y$

ANSWER:

x	$y = -x + 10$	y	(x, y)
0	$y = -(0) + 10$	10	(0, 10)
1	$y = -(1) + 10$	9	(1, 9)
2	$y = -(2) + 10$	8	(2, 8)



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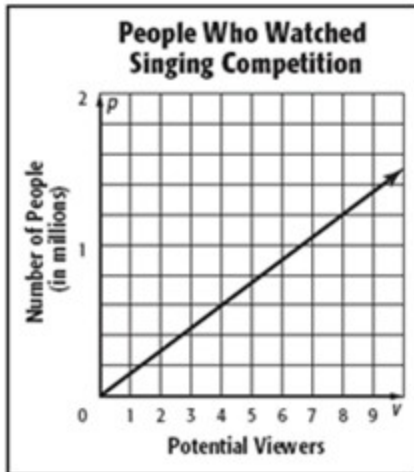
35. **TV RATINGS** The number of people who watch a singing competition can be given by $p = 0.15v$, where p represents the number of people in millions who saw the show and v is the number of potential viewers in millions.
- Make a table of values for the points (v, p) .
 - Graph the equation.
 - Use the graph to estimate the number of people who saw the show if there are 14 million potential viewers.
 - Explain why it would not make sense for v to be a negative number.

ANSWER:

a.

v	$p = 0.15v$	p	(v, p)
0	$p = 0.15(0)$	0	(0, 0)
2	$p = 0.15(2)$	0.3	(2, 0.3)
4	$p = 0.15(4)$	0.6	(4, 0.6)
6	$p = 0.15(6)$	0.9	(6, 0.9)
8	$p = 0.15(8)$	1.2	(8, 1.2)
10	$p = 0.15(10)$	1.5	(10, 1.5)

b.



- ≈ 2.1 million
- There cannot be fewer than 0 viewers.

Determine whether each equation is a linear equation. Write *yes* or *no*. If yes, write the equation in standard form.

36. $x + \frac{1}{y} = 7$

ANSWER:

no

37. $\frac{x}{2} = 10 + \frac{2y}{3}$

ANSWER:

yes; $3x - 4y = 60$

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38. $7n - 8m = 4 - 2m$

ANSWER:

yes; $6m - 7n = -4$

39. $3a + b - 2 = b$

ANSWER:

yes; $3a = 2$

40. $2r - 3rt + 5t = 1$

ANSWER:

no

41. $\frac{3m}{4} = \frac{2n}{3} - 5$

ANSWER:

yes, $9m - 8n = -60$

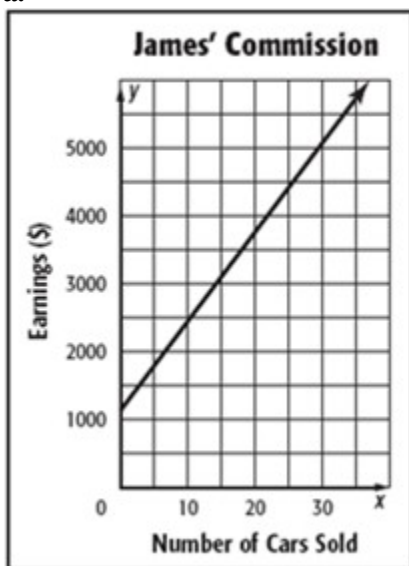
42. **FINANCIAL LITERACY** James earns a monthly salary of \$1200 and a commission of \$125 for each car he sells.

a. Graph an equation that represents how much James earns in a month in which he sells x cars.

b. Use the graph to estimate the number of cars James needs to sell in order to earn \$5000.

ANSWER:

a.



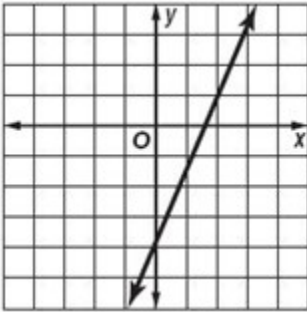
b. about 30 cars

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Graph each equation.

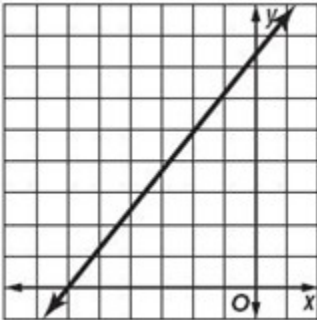
43. $2.5x - 4 = y$

ANSWER:



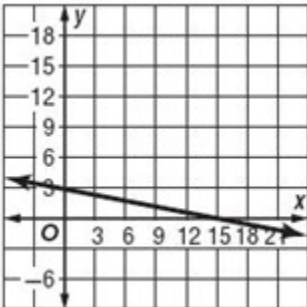
44. $1.25x + 7.5 = y$

ANSWER:



45. $y + \frac{1}{5}x = 3$

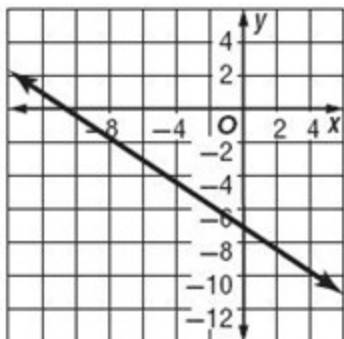
ANSWER:



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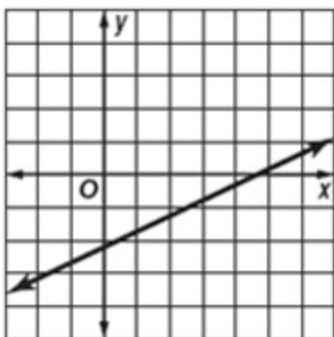
46. $\frac{2}{3}x + y = -7$

ANSWER:



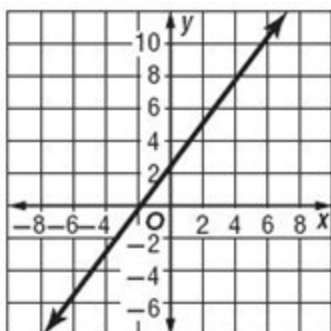
47. $2x - 3 = 4y + 6$

ANSWER:



48. $3y - 7 = 4x + 1$

ANSWER:



49. **CCSS REASONING** Mrs. Johnson is renting a car for vacation and plans to drive a total of 800 miles. A rental car company charges \$153 for the week including 700 miles and \$0.23 for each additional mile. If Mrs. Johnson has only \$160 to spend on the rental car, can she afford to rent a car? Explain your reasoning.

ANSWER:

No; sample answer: The rental car would cost \$176. Mrs. Johnson only has \$160 to spend.

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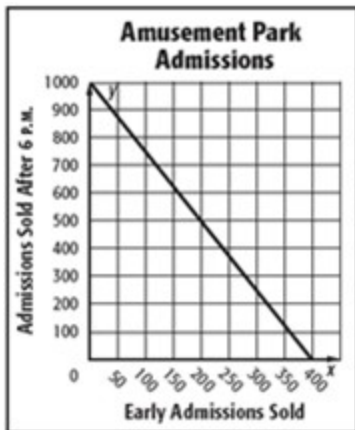
50. **AMUSEMENT PARKS** An amusement park charges \$50 for admission before 6 p.m. and \$20 for admission after 6 p.m. On Saturday, the park took in a total of \$20,000.

- Write an equation that represents the number of admissions that may have been sold. Let x represent the admissions sold before 6 p.m., and let y represent the admissions sold after 6 p.m.
- Graph the equation.
- Find the x - and y -intercepts of the graph. What does each intercept represent?

ANSWER:

a. $20,000 = 50x + 20y$

b.



c. 400; 1000; The x -intercept represents the number of admissions sold before 6 P.M. when no admissions are sold after 6 P.M. The y -intercept represents the number of admissions sold after 6 P.M. when no admissions are sold before 6 P.M.

Find the x -intercept and y -intercept of the graph of each equation.

51. $5x + 3y = 15$

ANSWER:

3; 5

52. $2x - 7y = 14$

ANSWER:

7; -2

53. $2x - 3y = 5$

ANSWER:

$2\frac{1}{2}$; $-1\frac{2}{3}$

54. $6x + 2y = 8$

ANSWER:

$1\frac{1}{3}$; 4

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55. $y = \frac{1}{4}x - 3$

ANSWER:

12; -3

56. $y = \frac{2}{3}x + 1$

ANSWER:

$-1\frac{1}{2}$; 1

57. **ONLINE GAMES** The percent of teens who play online games can be modeled by $p = \frac{15}{4}t + 66$. p is the percent of students and t represents time in years since 2000.

a. Graph the equation.

b. Use the graph to estimate the percent of students playing the games in 2008.

ANSWER:

a.



b. 96%