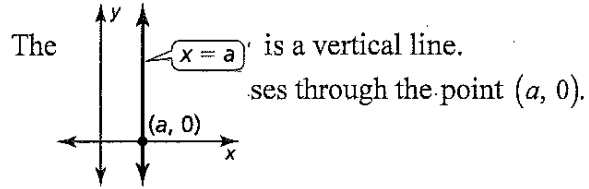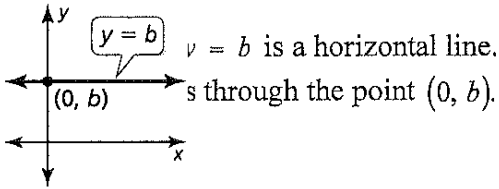# 3.4 Graphing Linear Equations in Standard Form

standard form $Ax + By = C$

x-intercept $(x, 0)$ to find: let $y = 0$ & solve for x
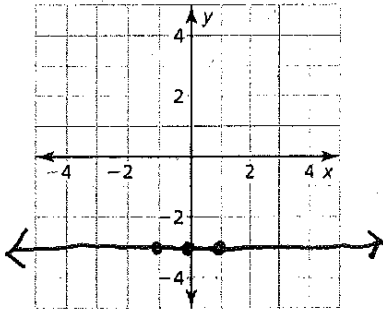
y-intercept $(0, y)$ to find: let $x = 0$ & solve for y
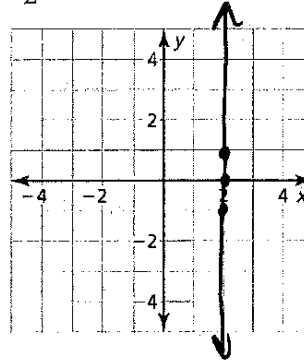
Horizontal and Vertical Lines

$y = b$ is a horizontal line.   The $x = a$ is a vertical line.
...s through the point $(0, b)$.   ...ses through the point $(a, 0)$.

Graph the linear equation.

1. $y = -3$	2. $x = 2$

1. $y = -3$

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

2. $x = 2$

x	y
2	-1
2	0
2	1

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

3. $3x + 4y = 12$

x-int: $3x + 4(0) = 12$

$\dfrac{3x}{3} = \dfrac{12}{3}$

$x = 4$ (4,0)

y-int: $3(0) + 4y = 12$

$\dfrac{4y}{4} = \dfrac{12}{4}$

$y = 3$ (0,3)

4. $5x - 2y = -30$

x-int: $3x - 2(0) = -30$

$\dfrac{3x}{3} = \dfrac{-30}{3}$

$x = -10$ (-10,0)

y-int: $3(0) - 2y = -30$

$-2y = -30$

$\dfrac{-2y}{-2} = \dfrac{-30}{-2}$

$y = 15$ (0,15)

Use intercepts to graph the linear equation. Label the points corresponding to the intercepts.

6. $-8x + 12y = 24$

X-int: $-8x + 12(0) = 24$
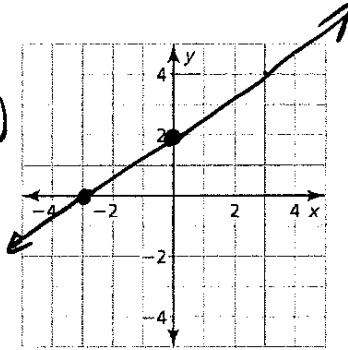
$\dfrac{-8x}{-8} = \dfrac{24}{-8}$

$x = -3$

(-3,0)

y-int:
$-8(0) + 12y = 24$

$\dfrac{12y}{12} = \dfrac{24}{12}$

$y = 2$

(0,2)

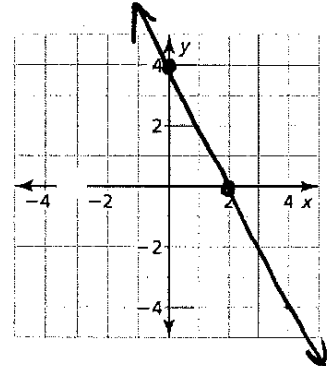**7.** $2x + y = 4$

X-int: $2x + 0 = 4$

$\dfrac{2x}{2} = \dfrac{4}{2}$

$x = 2$

(2,0)

y-int: $2(0) + y = 4$

$y = 4$

(0,4)

8. The school band is selling sweatshirts and baseball caps to raise $9000 to attend a band competition. Sweatshirts cost $25 each and baseball caps cost $10 each. The equation $25x + 10y = 9000$ models this situation, where x is the number of sweatshirts sold and y is the number of baseball caps sold.

  a. Find and interpret the intercepts.

X-int: $\dfrac{25x + 10(0)}{25} = \dfrac{9000}{25}$

$x = 360$ (360,0)

y-int: $\dfrac{25(0) + 10y}{10} = \dfrac{9000}{10}$

$y = 900$ (0,900)

  b. If 258 sweatshirts are sold, how many baseball caps are sold?

$25(258) + 10y = 9000$

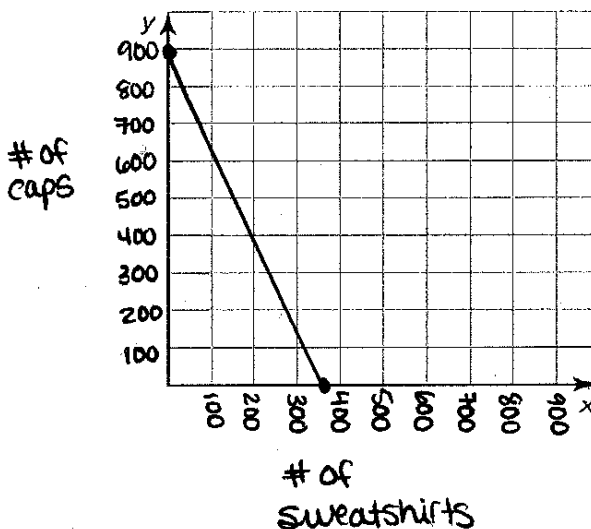$6450 + 10y = 9000$

$-6450 \qquad -6450$

$\dfrac{10y}{10} = \dfrac{2550}{10}$

$y = $ 255 baseball caps

  c. Graph the equation. Find two more possible solutions in the context of the problem.

# of caps

# of sweatshirts

let x=50 : $25(50) + 10y = 9000$

$1250 + 10y = 9000$

$10y = 7750$

$y = 775$

(50 sweatshirts & 775 caps)

let x=100 : $25(100) + 10y = 9000$

$2500 + 10y = 9000$

$10y = 6500$

$y = 650$

(100 sweatshirts & 650 caps)