4.4 *Write Linear Equations in Standard Form*

Remember: Ax + By = C is *standard form.*

- x's & y's on the same side
- usually no fractions or decimals

Rewrite each equation *in standard form*.

$y = 8x - 4$

$-8x \quad -8x$

$-8x + y = -4$

$5 \cdot (y) = \left(\frac{2}{5}x + 1\right) \cdot 5$

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

$5y = 2x + 5$

$-2x \quad -2x$

$-2x + 5y = 5$

$4 \cdot (y + 7) = 4 \left[\frac{3}{4}(x - 11)\right]$

$4(y+7) = -3(x-11)$

$4y + 28 = -3x + 33$

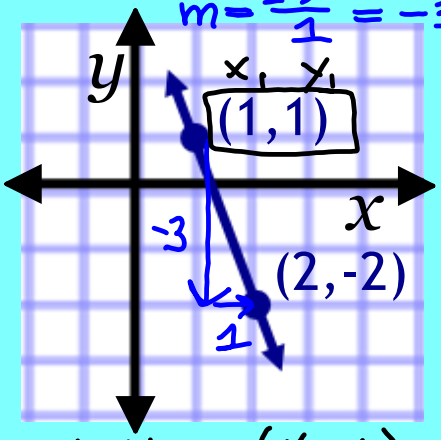
$-28 \qquad -28$

$4y = -3x + 5$

$+3x \qquad +3x$

$3x + 4y = 5$

Write an equation *in standard form* of each line shown.



$m = \frac{-3}{1} = -3$

$y - y_1 = m(x - x_1)$

$y - 1 = -3(x - 1)$

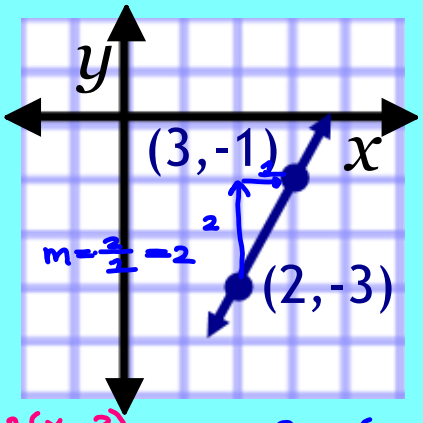
$y - 1 = -3x + 3$

$+3x \quad +3x$

$3x + y - 1 = 3$

$+1 \quad +1$

$3x + y = 4$



$m = \frac{-2}{1} = -2$

$y + 1 = 2(x - 3)$

$y + 1 = 2x - 6$

$-2x \quad -2x$

$-2x + y + 1 = -6$

$-1 \quad -1$

$-2x + y = -7$

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

$y + 3 = 2x - 4$

$-2x \quad -2x$

$-2x + y + 3 = -4$

$-3 \quad -3$

$-2x + y = -7$

Write an equation *in standard form* of the line that passes through (-3,4) and (-1,1).

$m = \frac{1-4}{-1+3} = \frac{-3}{2}$

$2 \cdot (y - 4) = 2\left[-\frac{3}{2}(x + 3)\right]$

$2(y - 4) = -3(x + 3)$

$2y - 8 = -3x - 9$

$+8 \quad +8$

$2y = -3x - 1$

$+3x \quad +3x$

$3x + 2y = -1$

A candle that is originally 10 inches long will burn at a rate of .5 inches per hour. Write an equation *in standard form* that models this situation.

y-intercept

m ~negative (burning)

$y = mx + b$

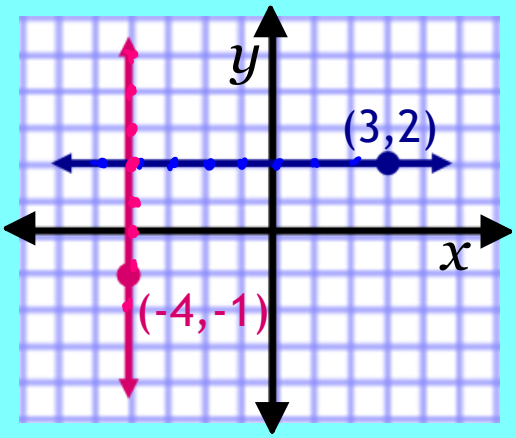
$y = -.5x + 10$

$+.5x \quad +.5x$

$10(.5x + y) = (10) \cdot 10$

$5x + 10y = 100$

Write an equation *of the specified line*.



a) the blue line

horizontal line $y = \#$

$y = 2$

b) the red line

vertical line $x = \#$

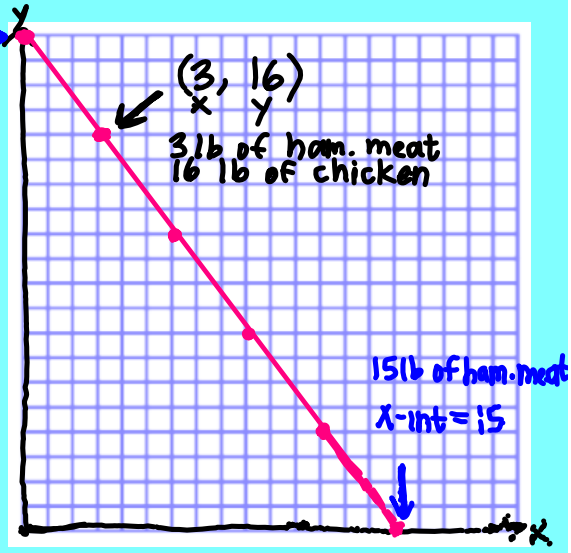
$x = -4$

Denise is planning for a family picnic. She is grilling out hamburgers (at \$4 per pound) and barbecue chicken (at \$3 per pound). If she has \$60 to spend...

a) Write an equation to represent this. $4x + 3y = 60$
b) Graph the equation.
c) Explain what the intercepts of this graph mean.
d) Find another point on the graph and explain it's meaning.

$4x+3y=60$
$-4x \quad -4x$
$\frac{3y}{3} = \frac{-4x}{3} + \frac{60}{3}$
$y = -\frac{4}{3}x + 20$
$m = -\frac{4}{3}$ y-int = 20

y-int = 20 → 20 lbs of chicken



T-shirts at a flea market cost \$4.50 each and shorts cost \$6 each. Tamara has enough money to buy exactly 12 T-shirts and 9 pairs of shorts. $(4.50)(12) + (6)(9) = \$108$ total

a) Write an equation in standard form that models the possible combinations of T-shirts & shorts she can buy.
b) Graph the equation.
c) List three possible combinations.

$4.50x + 6y = 108$

$4.50x + 6y = 108$

x-int
$4.50x + 6(0) = 108$
$\frac{4.50x}{4.50} = \frac{108}{4.50}$
$x = 24$

y-int
$4.50(0) + 6y = 108$
$\frac{6y}{6} = \frac{108}{6}$
$y = 18$

(24, 0) → 24 shirts, 0 shorts
(0, 18) → 0 shirts, 18 shorts