Get out you homework and Warm Up on the problem below. QUIZ on Monday!

Classwork - Writing Linear Equations in Slope Intercept Form

Warm Up: Write an equation in slope-intercept form for the line that passes through the points (3, 6) and (4, - 2).

$$m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow \frac{-2-6}{4-3} = \frac{-8}{1} \quad m = -8$$

$$y = mx + b$$

$$(4, -2)$$

OR

$$-8$$

$$(3, 6) \xi (4, -2) \quad m = \frac{-8}{1}$$

$$\boxed{y = -8x + 30}$$

$$-2 = -8(4) + b$$

$$-2 = -32 + b$$

$$+32 \quad +32$$

$$\overline{30 = b}$$

Write an equation in slope-intercept form for each line.

1. passes through $(-5, 6)$, slope $= 3$

$$6 = 3(-5) + b$$
$$6 = -15 + b$$
$$+15 \quad +15$$
$$21 = b$$

Equation → $y = 3x + 21$

2. passes through $(6, -6)$, slope $= 5$

$$-6 = 5(6) + b$$
$$-6 = 30 + b$$
$$-30 \quad -30$$
$$-36 = b$$

Equation → $y = 5x - 36$

3. passes through $(0, 1)$ and $(2, 5)$

y intercept

$$\frac{5-1}{2-0} = \frac{4}{2} = 2$$

Equation → $y = 2x + 1$

4. passes through $(-5, 9)$ and $(1, 3)$

$$(-5, 9) \quad (1, 3) \quad m = \frac{-6}{6} = -1$$

$$+6$$

$$3 = -1(1) + b$$
$$3 = -1 + b$$
$$+1 \quad +1$$
$$b = 4$$

Equation → $y = -x + 4$

5. passes through $(1, -1)$ and $(2, 0)$

$(1, -1) \; ; \; (2, 0)$

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

$0 = 2(1) + b$

$0 = 2 + b$

$-2 \quad -2 \qquad b = -2$

Equation → $\quad y = x - 2$

6. passes through $(-3, -5)$, slope $= 2$

$-5 = 2(-3) + b$

$-5 = -6 + b$

$+6 \quad +6$

$\overline{\qquad\qquad}$

$1 = b$

Equation → $\quad y = 2x + 1$

Write the slope intercept form equation for each line graphed.
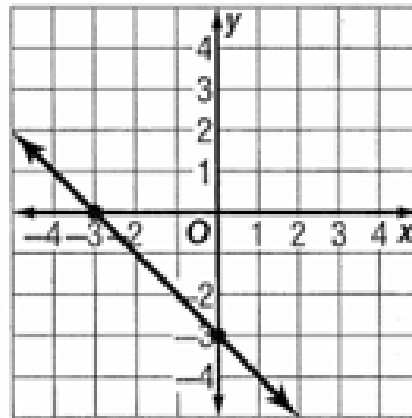
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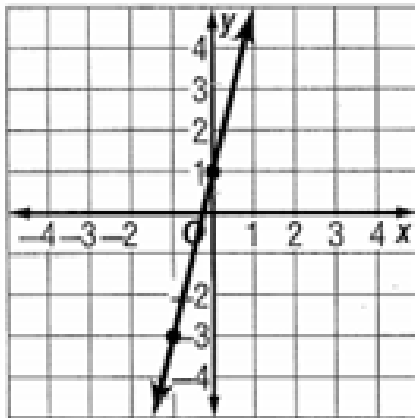
$m = \frac{4}{1} = 4 \qquad b = (0, 1)$

Equation → $\quad y = 4x + 1$

8.

$m = \frac{-1}{1} = -1 \qquad b = (0, -3)$

Equation → $\quad y = -x - 3$

4. The cost of assistance dog training sessions is shown in the table. Write an equation in point-slope form to represent the cost y of attending x dog training sessions.

x y

Number of Sessions	Cost ($)
5	165
10	290

+5 +125

Find the slope of the line. Then use the slope and one of the points to write the equation of the line.

$m = \dfrac{290 - 165}{10 - 5}$ $(x_2, y_2) = (10, 290), (x_1, y_1) = (5, 165)$

$m = \dfrac{125}{5}$ or 25   Simplify.

$y - 165 = 25(x - 5)$ Replace (x_1, y_1) with (5, 165) and m with 25 in the point-slope form equation.

So, the equation of the line is $y - 165 = 25(x - 5)$.

$(10, 290)$

$X = 10 \quad Y = 290$

$y = 25x + 40$

$290 = 25(10) + 40$

$290 = 250 + 40$

$290 = 290 ✓$

Slope Intercept Form Example

$(5, 165) \; \& \; (10, 290)$

$m = \dfrac{290 - 165}{10 - 5} = \dfrac{125}{5}$

$m = 25$

$(5, 165) \qquad y = mx + b$

$165 = 25(5) + b$

$165 = 125 + b$

$\underline{-125 \quad -125}$

$40 = b$

e. The cost for making spirit buttons is show in the table. Write an equation in point-slope form to represent the cost y of making x buttons.

x Number of Buttons	y Cost ($)
100	25
150	35

$(100, 25)$

$(150, 35)$

$$m = \frac{35-25}{150-100} = \frac{10}{50} = 0.2$$

$(\overset{x}{100}, \overset{y}{25})$ $m = 0.2$

$25 = 0.2(100) + b$

$25 = 20 + b$

$\underline{-20 \quad -20}$

$5 = b$

$\boxed{y = 0.2x + 5}$

Guided Practice: Write each equation in slope intercept form for each line.

1. passes through (2, 5), slope = 4

2. passes through (−3, 1) and (−2, −1)

3. Janelle is planning a party. The cost for 20 people is $290. The cost for 45 people is $590. Write an equation in ~~point slope form~~ to represent the cost y of having a party for x people. (Example 4)

$$(\#\text{ of people}, \text{ Cost})$$

$$(20, 290) \; \& \; (45, 590)$$

$$m = \frac{590-290}{45-20} = \frac{300}{25} = 12 \quad m=12$$

$$(20, 290)$$

$$y = mx + b$$

$$290 = 12(20) + b$$

$$290 = 240 + b$$

$$\frac{-240 \quad -240}{50 = b}$$

$$\boxed{y = 12x + 50}$$