Chapter 7 Review
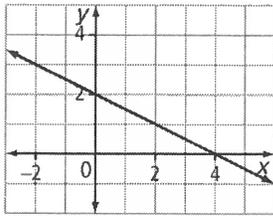
1. Which of the statements is true for the graph shown?

✗ A The domain is $\{x\mid x \geq 4, x \in R\}$. $\{x\mid -\infty < x < \infty, x \in R\}$

✗ B The range is $\{y\mid y \leq 4, y \in R\}$. $\{y\mid -\infty < y < \infty, y \in R\}$

✗ C The domain and range are both [2, 4]. $(-\infty, \infty)$

Ⓓ The domain and range are both (∞, ∞).

2. To rewrite the equation $-2x + 2y = 5$ in the form $y = mx + b$, a possible approach could be

A subtract 2x from both sides and then divide both sides by 2

Ⓑ add 2x to both sides and then divide both sides by 2

C add −2x to both sides and then multiply both sides by 2

D subtract 2x from both sides and then multiply both sides by 2

$$-2x + 2y = 5$$
$$+2x \qquad\qquad +2x$$
$$2y = 2x + 5$$
$$\div 2 \quad \div 2 \quad \div 2$$
$$y = x + 5/2$$
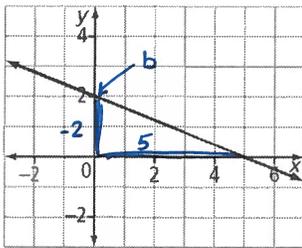
3. Which equation represents a linear relation that has an infinite number of intercepts?

A $y = x$ B $y = 2$

Ⓒ $y = 0$ D $y = x - 1$

↪ Gives points $(-5, 0), (3, 0) \dots (2016, 0), \dots$ etc.

4. For each graph, write an equation in slope – y-intercept form, general form, and slope point form.

$m = \dfrac{rise}{run} = \dfrac{-2}{5}$

$b = 2$

$\boxed{y = -\tfrac{2}{5}x + 2}$

$+\tfrac{2}{5}x \qquad +\tfrac{2}{5}x$

$\tfrac{2}{5}x + 1y = 2$

$\quad -2 \quad -2$

$\tfrac{2}{5}x + 1y - 2 = 0$

$\tfrac{2}{5}x + 1y - 2 = 0$

$\cdot 5 \quad \cdot 5 \quad \cdot 5 \quad \cdot 5$

$\boxed{2x + 5y - 10 = 0}$

If slope $= -\tfrac{2}{5}$

Pick a point... maybe (0,2).

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

$\boxed{(y - 2) = -\tfrac{2}{5}(x - 0)}$

$m = \dfrac{rise}{run} = \dfrac{-2}{5}$

$b = -2$

$\boxed{y = -\tfrac{2}{5}x - 2}$

$+\tfrac{2}{5}x \qquad +\tfrac{2}{5}x$

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

$\quad +2 \quad +2$
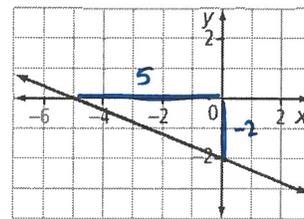
$\tfrac{2}{5}x + 1y + 2 = 0$

$\cdot 5 \quad \cdot 5 \quad \cdot 5 \quad \cdot 5$

$\boxed{2x + 5y + 10 = 0}$

If slope $= -\tfrac{2}{5}$

Pick a point... maybe (0,-2)

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

$\boxed{(y + 2) = -\tfrac{2}{5}(x - 0)}$

5. The *x*-intercept of the graph of
$5x - 3y - 15 = 0$ is □.

Set $y = 0$

$5x - 3(0) - 15 = 0$

$5x - 15 = 0$

$5x = 15$

$\boxed{x = 3}$

6. The slope of the graph of the relation

$x = \dfrac{1}{5}y + 2$ is □. → Put in $y = mx + b$ form

$-2-2$

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

$\cdot 5 \quad \cdot 5 \quad \cdot 5$

$5x - 10 = y$

$\boxed{y = 5x - 10}$ → Slope is 5.

7. The *y*-intercept of the graph of the line

$y - 3 = \dfrac{1}{2}(x + 10)$ is □.

Set $x = 0$

$y - 3 = \frac{1}{2}(10)$

$y - 3 = 5$

$y - 3 = 5$

$+3 \quad +3$

$\boxed{y = 8}$

8. Use slope-point form to determine an equation of a line through each pair of points. Express each equation in the form $y = mx + b$ and in the form $Ax + By + C = 0$.

(6, 3) and (1, −2)
$x_1 \; y_1 \qquad x_2 \; y_2$

$m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{-2 - 3}{1 - 6}$

$= \dfrac{-5}{-5} = 1$

Slope = 1

Slope point... pick a point.
Maybe (6, 3)?

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

$\boxed{(y - 3) = 1(x - 6)}$

Could have also
been $(y + 2) = 1(x - 1)$

$y - 3 = 1(x - 6)$

$y - 3 = x - 6$

$+3 \quad +3$

$\boxed{y = x - 3}$

Slope y-intercept form

$y = x - 3$

$-y \qquad -y$

$0 = x - y - 3$

$\boxed{x - y - 3 = 0}$

$Ax + By + C = 0$ form.

9. Write an equation of a line in the form $y = mx + b$ that is perpendicular to each line and passes through the given point. $\qquad 4x + 2y - 3 = 0, \; (0, 5)$

What is slope of $4x + 2y - 3 = 0$?

$-4x \qquad\qquad -4x$

$2y - 3 = -4x$

$+3 \qquad\quad +3$

$2y = -4x + 3$

$\div 2 \quad \div 2 \quad \div 2$

$y = -2x + 3/2$

Slope of original line is $\dfrac{-2}{1}$.

Slope of perpendicular line is $+\dfrac{1}{2}$

(negative reciprocal)

So our perpendicular line is

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

Use point (0,5) to find b.

Option #1: Math it out.

$5 = \frac{1}{2}(0) + b$

$5 = b$

Option #2: Remember definition of y-intercept (x=0).

(0,5) → when x=0, y=5.

y-intercept.

Build our line

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