5-Minute Check Lesson 1-5A

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

1. $6x - 2y + 7 = 0$ Answer: $y = 3x + \frac{7}{2}$

2. passes through $(-6, -9)$, slope $= \frac{2}{3}$ Answer: $y = \frac{2}{3}x - 5$

3. passes through $A\left(-\frac{1}{2}, 4\right)$ and $B\left(\frac{1}{2}, 6\right)$ Answer: $y = 2x + 5$

4. the x-axis Answer: $y = 0$

5. vertical and passes through $(-2, 1)$ Answer: $x = -2$

Alternate Warm Up

- On a sticky note, give information to write the equation of a line:
  - 2 points
  - Point and slope
  - Slope and y-intercept

- Then exchange notes with a friend who will write the equation.
- Check your answers, put both names on back and put on back window by the Essential Question.

1.5: Parallel & Perpendicular Lines

- Writing equations of parallel and perpendicular lines.

Lesson 1.5
Writing Equations of Parallel and Perpendicular Lines

What is unique about the equations of parallel and perpendicular lines?

Vocabulary
- Parallel lines
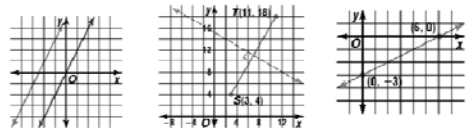- Coincide
- Perpendicular lines

What makes lines parallel or perpendicular to each other?

Parallel Lines – Two lines are parallel if they have no points in common and have equal slopes.

Perpendicular Lines – Two lines are perpendicular if they meet at a right angle and have opposite reciprocal slopes.

Coinciding – Two lines are coinciding if they share all the same points and have equal slopes.

Example 1 Determine whether the graphs of the equations $x + 4y = -8$ and $12x - 3y = -3$ are *parallel, coinciding, perpendicular,* or *none of these.*

Write each equation in slope-intercept form.

$x + 4y = -8$ $12x - 3y = -3$
$y = -\frac{1}{4}x - 2$ $y = 4x + 1$

The lines have slopes that are opposite reciprocals. Therefore, the lines are perpendicular.

Example 2   Write the standard form of the equation of the line
that passes through the point at $(-3, -6)$ and is
parallel to the graph of $4x - 7y + 3 = 0$.

Any line parallel to the graph of $4x - 7y + 3 = 0$ will have the
same slope. Find the slope of the graph of $4x - 7y + 3 = 0$.

$$m = -\frac{A}{B}$$

$$= -\frac{4}{(-7)} \text{ or } \frac{4}{7} \qquad A = 4 \text{ and } B = -7$$

Example 2   Write the standard form of the equation of the line
that passes through the point at $(-3, -6)$ and is
parallel to the graph of $4x - 7y + 3 = 0$.

Use point-slope form to write the equation of the line.

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

$$y - (-6) = \frac{4}{7}[x - (-3)] \qquad \text{Substitute } -3 \text{ for } x_1, -6 \text{ for } y_1, \text{ and } \frac{4}{7} \text{ for } m.$$

$$y + 6 = \frac{4}{7}x + \frac{12}{7}$$

$$7y + 42 = 4x + 12 \qquad \text{Multiply each side by 7.}$$

$$4x - 7y - 30 = 0 \qquad \text{Write in standard form.}$$

Example 3

- Write the slope-intercept form of the equation of a line that passes through (7,-2) and is perpendicular to $6x - y = 3$