

Name: _____

Date: _____

UNIT 7**LESSON 3****AIM: HOW DO WE WRITE THE EQUATIONS OF LINES IN SLOPE-INTERCEPT FORM?**

Do Now: For each of the following equations, rearrange into $y = mx + b$ form and identify the slope and y-intercept of the line.

(a) $y + 2x = 7$

(b) $2x + 3y = 12$

(c) $x - 6y = 7$

Equation of a Line in Slope-Intercept Form

What is the relationship?

Line a: $y = \frac{1}{2}x + 4$

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

What is the relationship?

Line c: $y = \frac{2}{3}x + 1$

Line d: $y = -\frac{3}{2}x - 3$

Line a and line b are _____ because

Line c and line d are _____ because

Example 1: What is an equation of a line that is perpendicular to the line whose equation is $2y + 3x = 1$?

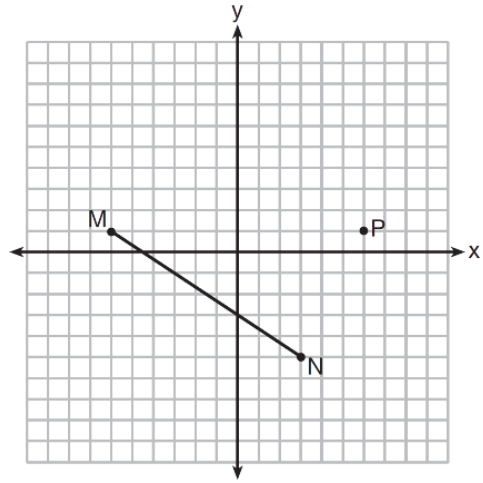
1) $y = \frac{2}{3}x + \frac{5}{2}$

2) $y = \frac{3}{2}x + 2$

3) $y = -\frac{2}{3}x + 1$

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

Example 2: Given \overline{MN} shown below, with $M(-6, 1)$ and $N(3, -5)$, what is an equation of the line that passes through point $P(6, 1)$ and is parallel to \overline{MN} ?



1) $y = -\frac{2}{3}x + 5$

2) $y = -\frac{2}{3}x - 3$

3) $y = \frac{3}{2}x + 7$

4) $y = \frac{3}{2}x - 8$

Point – Slope form of a Linear Equation

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

$$y - \boxed{y_1} = \boxed{m}(x - \boxed{x_1})$$

Example 3: Which equation represents a line parallel to the line whose equation is $-2x + 3y = -4$?

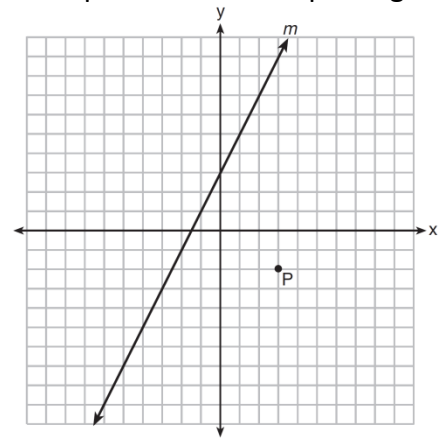
1) $y - 3 = -\frac{3}{2}(x - 1)$

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

3) $y = \frac{3}{2}x - 4$

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

Example 4: Line m and point P are shown in the graph below. Which equation represents the line passing through P and parallel to line m ?



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

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

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

4) $y + 2 = -\frac{1}{2}(x - 3)$

Example 5: Write an equation of a line that is **perpendicular** to the line $y = \frac{2}{3}x + 5$ and that passes through the point $(0, 4)$.

Example 6: Find an equation of the line passing through the point $(5, 4)$ and **parallel** to the line whose equation is $2x + y = 3$.

Example 7: Two lines are represented by the equations $x + 2y = 4$ and $4y - 2x = 12$. Determine whether these lines are parallel, perpendicular, or neither. Explain your answer.

Practice NYTS (Now You Try Some!)

1. Write an equation of the line that passes through the point $(6, -5)$ and is **parallel** to the line whose equation is $2x - 3y = 11$.

2. What is an equation of the line that passes through the point $(6, 8)$ and is **perpendicular** to a line with equation $y = \frac{3}{2}x + 5$?

3. Which equation represents a line that is **parallel** to the line whose equation is $y = \frac{3}{2}x - 3$ and passes through the point $(1, 2)$?

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

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

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

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

4. What is an equation of the line that passes through the point $(2, 4)$ and is **perpendicular** to the line whose equation is $3y = 6x + 3$?

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

2) $y = -\frac{1}{2}x + 4$

3) $y = 2x - 6$

4) $y = 2x$

5. What is an equation of the line that passes through the point $(-2, 3)$ and is parallel to the line whose equation is $y = \frac{3}{2}x - 4$?

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

2) $y = \frac{-2}{3}x + \frac{5}{3}$

3) $y = \frac{3}{2}x$

4) $y = \frac{3}{2}x + 6$

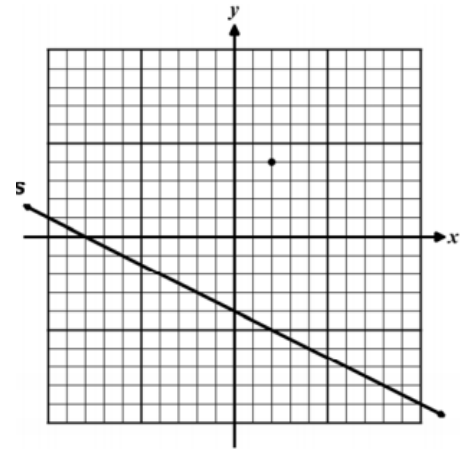
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UNIT 7

LESSON 3 HOMEWORK

1. On the grid below, the line, s , is graphed as well as the point $(2, 4)$. Write the equation of a line parallel to line s that passes through the point $(2, 4)$.



2. What is the slope of a line perpendicular to the line whose equation is $3x - 7y + 14 = 0$?

- 1) $\frac{3}{7}$
- 2) $-\frac{7}{3}$
- 3) 3
- 4) $-\frac{1}{3}$

3. Find an equation of the line passing through the point $(6, 5)$ and **perpendicular** to the line whose equation is $2y + 3x = 6$.

4. What is the equation of a line passing through the point $(6, 1)$ and **parallel** to the line whose equation is $3x = 2y + 4$?