

## Equations of Lines Review

1. What is an equation of the line that is perpendicular to the line whose equation is  $y = \frac{3}{5}x - 2$  and that passes through the point  $(3, -6)$ ? negative reciprocal slopes

1)  $y = \frac{5}{3}x - 11$

2)  $y = -\frac{5}{3}x + 11$

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

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

$y - y_1 = m(x - x_1)$   $m_{\perp} = -\frac{5}{3}$   
 $y + 6 = -\frac{5}{3}(x - 3)$   $x_1 = 3$   
 $y + 6 = -\frac{5}{3}x + 5$   $y_1 = -6$   
 $-6$   $y = -\frac{5}{3}x - 1$

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

1)  $y - 8 = \frac{3}{2}(x - 6)$

3)  $y + 8 = \frac{3}{2}(x + 6)$

2)  $y - 8 = -\frac{2}{3}(x - 6)$

4)  $y + 8 = -\frac{2}{3}(x + 6)$

$y - y_1 = m(x - x_1)$   $m_{\perp} = -\frac{2}{3}$   
 $y - 8 = -\frac{2}{3}(x - 6)$   $x_1 = 6$   
 $y_1 = 8$

3. The equation of a line is  $y = \frac{2}{3}x + 5$ . What is an equation of the line that is perpendicular to the given line and that passes through the point  $(4, 2)$ ? negative reciprocal slopes

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

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

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

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

$y - y_1 = m(x - x_1)$   $m_{\perp} = -\frac{3}{2}$   
 $y - 2 = -\frac{3}{2}(x - 4)$   $x_1 = 4$   
 $y/2 = -\frac{3}{2}x + 6$   $y_1 = 2$   
 $+2$   $+2$   
 $y = -\frac{3}{2}x + 8$

4. What is an equation of a line which passes through  $(6, 9)$  and is perpendicular to the line whose equation is  $4x - 6y = 15$ ? negative reciprocal slopes

1)  $y - 9 = -\frac{3}{2}(x - 6)$

3)  $y + 9 = -\frac{3}{2}(x + 6)$

2)  $y - 9 = \frac{2}{3}(x - 6)$

4)  $y + 9 = \frac{2}{3}(x + 6)$

$y - y_1 = m(x - x_1)$   $m_{\perp} = -\frac{3}{2}$   
 $y - 9 = -\frac{3}{2}(x - 6)$   $x_1 = 6$   
 $y_1 = 9$

$\rightarrow 4x - 6y = 15$   
 $-4x$   $-4x$   
 $-6y = -4x + 15$   
 $-6$   $-6$   
 $y = \frac{2}{3}x - \frac{5}{2}$

5. The line  $y = \frac{1}{2}x - 2$  is dilated by a scale factor of 2 centered at the origin. Write an equation that represents the image of the line after the dilation.

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

3)  $y = x - 4$

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

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

4)  $y = x - 2$

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

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

multiply scale factor and b.

6. The line  $y = \frac{1}{2}x - 2$  is dilated by a scale factor of 2 and centered at  $(0, -2)$ . Write an equation that represents the image of the line after the dilation.

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

3)  $y = x - 4$

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

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

4)  $y = x - 2$

$-2 = \frac{1}{2}(0) - 2$

$-2 = -2$  ✓

Same b

xy  
on the line?

7. The line  $y = 2x - 4$  is dilated by a scale factor of  $\frac{3}{2}$  and centered at the origin. Which equation represents the image of the line after the dilation?

1)  $y = 2x - 4$

2)  $y = 2x - 6$

3)  $y = 3x - 4$

4)  $y = 3x - 6$

$m = 2$

$b = \frac{3}{2}(-4) = -6$

$y = 2x - 6$

multiply scale factor and b

8. The equation of line  $h$  is  $2x + y = 1$ . Line  $m$  is the image of line  $h$  after a dilation of scale factor 4 with respect to the origin. What is the equation of the line  $m$ ?

1)  $y = -2x + 1$

2)  $y = -2x + 4$

3)  $y = 2x + 4$

4)  $y = 2x + 1$

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

$y = -2x + 1$

$m = -2$

$b = 4(1) = 4$

$y = -2x + 4$

Same slope

9. The line  $y = -5x - 1$  is dilated by a scale factor of 2 and centered at the  $(0, -1)$ . Write an equation that represents the image of the line after the dilation.

1)  $y = -5x - 1$

2)  $y = -5x - 2$

3)  $y = 10x - 1$

4)  $y = 10x - 2$

$y = -5x - 1$   
 $-1 = -5(0) - 1$   
 $-1 = -1$  ✓

Same b

xy  
on the line?

Same slope