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Geometry

Multiple Choice

## Linear Equations Through a Point Regents Practice

1. What is the equation of a line that passes through the point  $(-3, -11)$  and is parallel to the line whose equation is  $2x - y = 4$ ?

1)  $y = 2x + 5$

2)  $y = 2x - 5$

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

3)  $y = \frac{1}{2}x + \frac{25}{2}$

4)  $y = -\frac{1}{2}x - \frac{25}{2}$

$y - y_1 = m(x - x_1) \quad m \parallel = 2$   
 $x_1 = -3$   
 $y_1 = -11$   
 $y + 11 = 2(x + 3)$   
 $y + 11 = 2x + 6$   
 $-11 \quad -11$   
 $y = 2x - 5$

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

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

2)  $y - 5 = -2(x + 2)$

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

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

4)  $y + 5 = -2(x - 2)$

$y - y_1 = m(x - x_1) \quad m \perp = -2$   
 $x_1 = -2$   
 $y_1 = 5$   
 $y - 5 = -2(x + 2)$

3. What is an equation of the line that contains the point  $(3, -1)$  and is perpendicular to the line whose equation is  $y = -3x + 2$ ?

1)  $y = -3x + 8$

2)  $y = -3x$

$m = -3$

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

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

$y - y_1 = m(x - x_1) \quad m \perp = \frac{1}{3}$   
 $x_1 = 3$   
 $y_1 = -1$   
 $y + 1 = \frac{1}{3}(x - 3)$   
 $y + 1 = \frac{1}{3}x - 1$   
 $-1 \quad -1$   
 $y = \frac{1}{3}x - 2$

4. An equation of the line that passes through  $(2, -1)$  and is parallel to the line  $2y + 3x = 8$  is

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

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

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

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

$m \parallel = -\frac{3}{2}$   
 $x_1 = 2$   
 $y_1 = -1$   
 $y - y_1 = m(x - x_1)$   
 $y + 1 = -\frac{3}{2}(x - 2)$   
 ~~$y + 1 = -\frac{3}{2}x + 3$~~

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

5. 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  $(3, -6)$ ?

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

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

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

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

$m_{\perp} = -\frac{5}{3}$   
 $x_1 = 3$   
 $y_1 = -6$

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

$m = \frac{3}{5}$

6. Which equation represents a line that is perpendicular to the line represented by  $y = \frac{2}{3}x + 1$ ?

1)  $3x + 2y = 12$

2)  $3x - 2y = 12$

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

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

$m_{\perp} = -\frac{3}{2}$

$3x + 2y = 12$   
 $3x \quad -3x$   
 $2y = -3x + 12$   
 $y = -\frac{3}{2}x + 6$

$m = \frac{2}{3}$

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

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

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

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

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

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

$m_{\perp} = -\frac{2}{3}$   
 $x_1 = 6$   
 $y_1 = 8$

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

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

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

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

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

$4x - 6y = 15$   
 $-4x \quad -4x$

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

$m = \frac{2}{3}$

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

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

$x_1 = 6$   
 $y_1 = 9$

9. What is an equation of a line that is perpendicular to the line whose equation is  $2y = 3x - 10$  and passes through  $(-6, 1)$ ?

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

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

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

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

4)  $y = \frac{2}{3}x + 10$

$m = \frac{3}{2}$

$m_{\perp} = -\frac{2}{3}$   
 $x_1 = -6$   
 $y_1 = 1$

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

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

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

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

10. Which equation represents the line that passes through the point  $(-2, 2)$  and is parallel to

$y = \frac{1}{2}x + 8$ ?  $m = \frac{1}{2}$

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

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

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

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

$m_{||} = \frac{1}{2}$

$x_1 = -2$

$y_1 = 2$

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

2)  $y = -2x - 3$

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

4)  $y = -2x + 3$

11. What is an equation of the line that passes through the point  $(7, 3)$  and is parallel to the line  $4x + 2y = 10$ ?

1)  $y - 3 = \frac{1}{2}(x - 7)$

3)  $y + 3 = \frac{1}{2}(x + 7)$

$4x + 2y = 10$   
 $-4x$   $-2y$

$-2y = -4x + 10$   
 $\frac{-2y}{-2} = \frac{-4x + 10}{-2}$

$y = -2x + 5$

$m = -2$

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

$m_{||} = -2$

$x_1 = 7$

$y_1 = 3$

2)  $y - 3 = -2(x - 7)$

4)  $y + 3 = -2(x + 7)$

$y - 3 = -2(x - 7)$

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

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

$m_{||} = \frac{3}{2}$

$x_1 = -2$

$y_1 = 3$

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

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

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

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

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

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

13. Write the equation of a line perpendicular to  $4y + 3x = 10$  that passes through  $(-1, 0)$ .

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

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

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

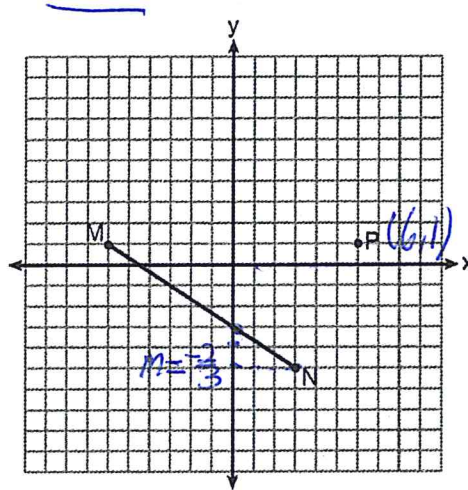
4)  $y+1 = \frac{4}{3}x$

$-3x - 3x$   
 $\frac{4y}{4} = \frac{-3x+10}{4}$   
 $y = -\frac{3}{4}x + \frac{5}{2}$   
 $m = -\frac{3}{4}$

$m_{\perp} = \frac{4}{3}$   
 $x_1 = -1$   
 $y_1 = 0$

$y - 0 = \frac{4}{3}(x+1)$

14. 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  $\overline{MN}$ ?



$m_{\parallel} = -\frac{2}{3}$

$x_1 = 6$   
 $y_1 = 1$

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

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

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

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

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

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

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

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