

Lesson 1: Reviewing Equations of Lines

1. Slope:

Find the slope of the line that passes through $A(-3,4)$ and $B(5,-2)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 4}{5 - (-3)} = \frac{-6}{5 + 3} = \frac{-6}{8} = -\frac{3}{4}$$

∴ The slope is $-\frac{3}{4}$

2. Equation of the line:

a) Find the equation of the line in Standard Form given a slope of -6 , passing through the point $R(-2,3)$.

$m = -6$ $R(-2,3)$

$$Ax + By + C = 0$$

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

$$y - 3 = (-6)(x - (-2))$$

$$y - 3 = (-6)(x + 2)$$

$$y - 3 = -6x - 12$$

collect all the terms where "x" will be positive

$$6x + y - 3 + 12 = 0$$

$$6x + y + 9 = 0$$

b) Find the equation of the line in Standard Form passing through $K(-2,5)$ and $G(6,-1)$.

① Find slope (m) first

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(-1) - (5)}{(6) - (-2)} = \frac{-6}{8} = -\frac{3}{4} \quad \left. \vphantom{m} \right\} m = -\frac{3}{4}$$

② Use slope and Point formula

$$y - y_1 = m(x - x_1) \quad K(-2,5)$$

$$y - 5 = -\frac{3}{4}(x - (-2))$$

$$4(y - 5) = -3(x + 2)$$

$$4y - 20 = -3x - 6$$

④ collect all the terms where x will be positive

$$3x + 4y - 20 + 6 = 0$$

$$3x + 4y - 14 = 0$$

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c) Find the equation of the line in Standard Form given a slope of $\frac{2}{3}$ passing through $P(-4,5)$.

$m = \frac{2}{3}$ $P(-4,5)$
 $y - y_1 = m(x - x_1)$
 $y - 5 = \frac{2}{3}(x - (-4))$ *multiply each side by 3 to get rid of*
 $3(y - 5) = 2(x + 4)$
 $3y - 15 = 2x + 8$

Collect all the terms where "x" will be positive
 $0 = 2x - 3y + 8 + 15$
 $0 = 2x - 3y + 23$
 Then you can switch sides
 $\therefore 2x - 3y + 23 = 0$

d) Find the equation of the line in Standard Form that is perpendicular to $y = 3x + 5$ passing through $W(-2,4)$.

① $y = 3x + 5$
 $m_1 = 3$



$m_1 \times m_2 = -1$
 $3 \times m_2 = -1$
 $m_2 = -\frac{1}{3}$

② $y - y_1 = m(x - x_1)$
 $y - 4 = -\frac{1}{3}(x - (-2))$
 $3(y - 4) = -(x + 2)$
 $3y - 12 = -x - 2$
 $x + 3y - 10 = 0$

$W(-2,4)$

Work on p.54 #4bc, 5cd, 6ab, 7 & 8