

Pre-Calculus
Linear Functions Review Problems

1) Write the slope-intercept form of a line that passes through the points $(-2, 6)$ and $(5, -1)$. $m = \frac{-7}{7} = -1$

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

$$y - 6 = -x - 2$$

$$y + 6 = -x + 4$$

$$y = -x + 4$$

2) Write the standard form of the line passing through $(4, 9)$ that is perpendicular to the line represented by $2x - 5y + 7 = 0$.

$$-5y = -2x - 7$$

$$y = \frac{2}{5}x + \frac{7}{5}$$

$$\perp m = -\frac{5}{2}$$

$$y - 9 = -\frac{5}{2}(x - 4)$$

$$y - 9 = -\frac{5}{2}x + 10$$

$$y = -\frac{5}{2}x + 19$$

$$\frac{5}{2}x + y = 19$$

$$5x + 2y = 38$$

3) Are the lines $3y - 4x = 5$ and $4y + 3x = 6$ parallel, perpendicular, or neither? Explain how you know?

$$m = \frac{4}{3}$$

$$m = -\frac{3}{4}$$

Perpendicular

Perpendicular; Product of slopes = -1

4) Write the equation of the line that is parallel to the x-axis passing through $f(x) = x^2 - 10x - 7$ evaluated at $f(-2)$.

x-axis is horizontal

point $(-2, 17)$

$$f(-2) = (-2)^2 - 10(-2) - 7$$

$$= 4 + 20 - 7$$

$$= 17$$

$$y = 17$$

5) Given the values in the table are derived from a linear function, complete the table.

$y = 5x + 2$

x	f(x)
4	-18
$\frac{1}{5}$	1
0	2
-3	17
$\frac{32}{5}$	-30
7	-33

$$1 = -5x + 2$$

$$-2 = -2$$

$$-1 = -5x$$

$$\frac{1}{5} = x$$

$$-30 = -5x + 2$$

$$-32 = -5x$$

$$\frac{32}{5} = x$$

$(4, 18)$ $(-3, 17)$

$$m = \frac{17 - 18}{-3 - 4} = \frac{-1}{-7} = \frac{1}{7}$$

$$y + 18 = -5(x - 4)$$

$$y = -5x + 20 - 18$$

$$y = -5x + 2$$

$$y = -5(7) + 2 = -33$$

6) Determine the slope of the line that passes through $(a + 2, b - 1)$ and $(a - 2, b)$.

$$m = \frac{(b-1) - b}{(a+2) - (a-2)} = \frac{-1}{a+2-a+2} = \frac{-1}{4}$$

7) If a rectangle was drawn on a coordinate grid, not parallel to any axis, what would be the product of the slopes of the four line segments of that rectangle? Explain how you arrived at your answer.

1 explain

8) Given the point $P(-3, 5)$ lies on the line $kx + 3y + 9 = 0$, determine the value of k .

$$k(-3) + 3(5) + 9 = 0$$

$$-3k + 15 + 9 = 0$$

$$-3k = -24$$

$$k = 8$$

$$k = 8$$