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2.4. Advanced Algebra Writing Equations

DATE: 9/12

With your partner, fill in the blank to recall your prior knowledge.

- Given the slope-intercept form $y = mx + b$, m represents the slope
and b represents the y-intercept.
- The slope formula is $m = \frac{y_2 - y_1}{x_2 - x_1}$ or $\frac{y_1 - y_2}{x_1 - x_2}$.
- The slopes of parallel lines are equal.
- The slopes of perpendicular lines are opposite reciprocals
and their product is always equal to -1.

Example 1

Write an equation in slope-intercept form of the line with slope $-\frac{3}{2}$ that passes through $(-4, 1)$.

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Example 1

Write an equation in slope-intercept form of the line with slope $-\frac{3}{2}$ that passes through $(-4, 1)$.

Slope intercept form is:

$$y = mx + b \leftarrow \text{Substitute slope value and } x, y \text{ values}$$

$$1 = -\frac{3}{2} \cdot -4 + b \leftarrow \text{Now we can solve for } b \text{ and find its value.}$$

$$1 = 6 + b$$

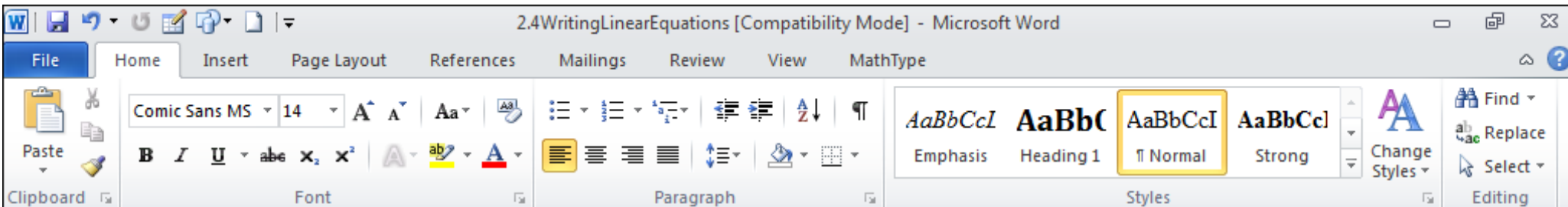
$$-5 = b$$

Final ans: $y = mx + b$

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

Multiply fractions across

$$-\frac{3}{2} \cdot -4 = \frac{+12}{2} = 6$$



What's the condition here?

Two equals a +

$$\frac{1}{-3} \cdot -1 = \frac{1}{1}$$

$$= \frac{-1}{-3}$$

$$= \frac{1}{3}$$

Example 2

Write an equation of the line that passes through $(-1, 4)$ and $(-4, 5)$?

Same process as Ex 1 but need slope first:

$x_1 y_1 \quad x_2 y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{5 - 4}{-4 - (-1)} = \frac{1}{-3} \text{ slope}$$

$$y = mx + b$$

Choose $(-1, 4)$ or $(-4, 5)$
I'll choose $(-1, 4)$.

$$4 = \frac{1}{-3} \cdot -1 + b$$

$$4 = \frac{1}{3} + b$$

$$3 \cdot 4 = 3 \cdot \frac{1}{3} + 3b$$

Mult by 3 to get rid of fraction

$$12 = 1 + 3b$$

$$\frac{11}{3} = \frac{3b}{3} \quad \frac{11}{3} = b$$

Final ans: $y = mx + b$

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

Example 3

Write an equation of the line that passes through $(-4, 3)$ and is perpendicular to the line whose equation is $y = -4x - 1$.