13-2 / 13-3 Slopes of Lines

What is slope? $\frac{\text{rise}}{\text{run}} = \frac{\text{vertical change}}{\text{horizontal change}}$

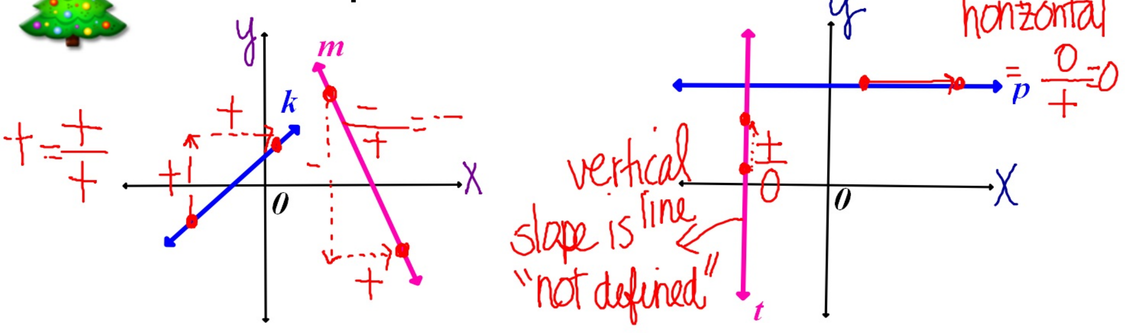
steepness of a line

The slope of a line through points (x_1, y_1) and (x_2, y_2) is $\frac{y_2 - y_1}{x_2 - x_1}$.

ex. 1 **Find the slope of a line through ($\overset{x_1,y_1}{2, -1}$) and ($\overset{x_2,y_2}{-5, -3}$).**

$$m = \frac{-3-(-1)}{-5-2} = \frac{-2}{-7} = \frac{2}{7}$$

Kinds of slopes



Slopes of parallel lines are equal.
Slopes of perpendicular lines are negative reciprocals.

$\frac{2}{3}, \frac{-3}{2}$

$-\frac{1}{8}, 8$

ex. 2 **Given *P* (-3, 8) and *Q* (4, 2).**
Find (a) the slope of $\overline{PQ}$

$\frac{8-2}{-3-4} = \frac{6}{-7}$ OR $\frac{2-8}{4-(-3)} = \frac{-6}{7}$

(b) the slope of a line parallel to $\overline{PQ}$ $-6/7$

(c) the slope of a line perpendicular to $\overline{PQ}$ $\frac{7}{6}$

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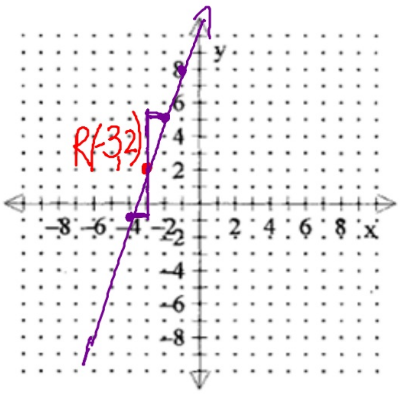
ex. 3 **Graph a line through *R* (-3, 2) with slope 3.** $= \frac{3}{1}$
Find 2 other points on this line.



(-2, 5)
(-4, -1)
(-1, 8)