

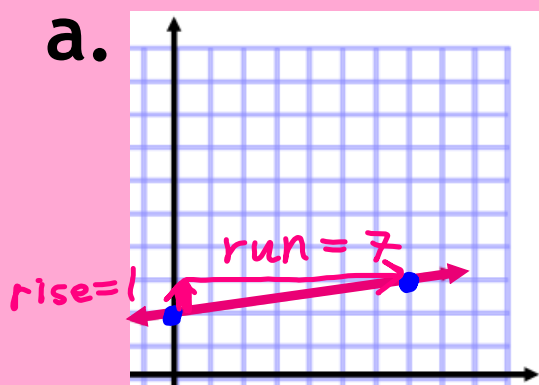
3.4 SLOPES OF LINES

The slope of a line is the ratio of its vertical rise to the horizontal run.

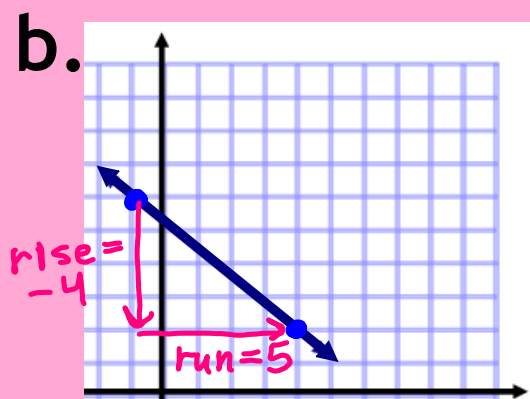
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$$

Example 1

Find the slope of each line.



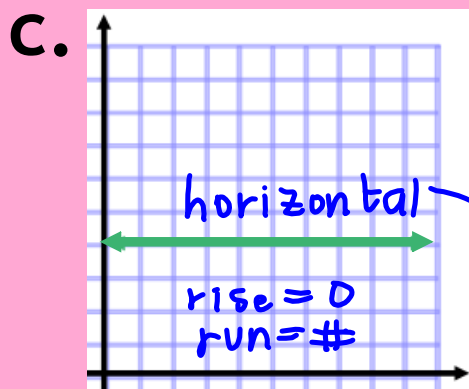
$$m = \frac{1}{7}$$



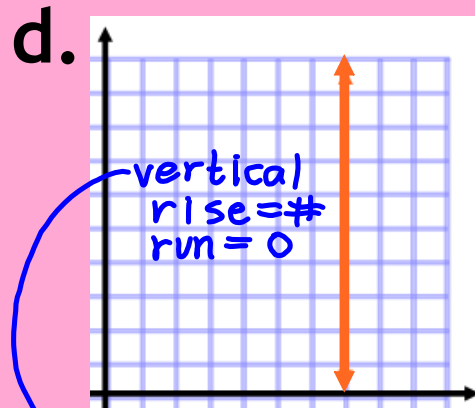
$$m = -\frac{4}{5}$$

Example 1

Find the slope of each line.

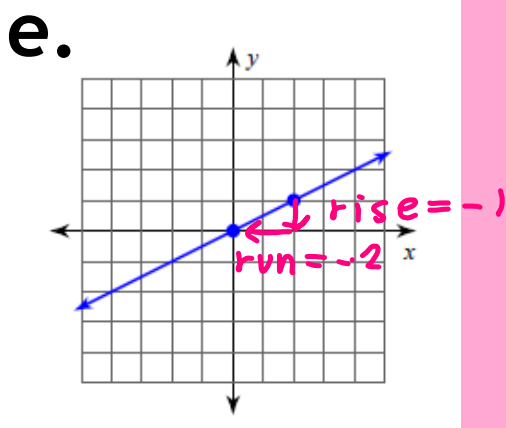


$$m = 0$$

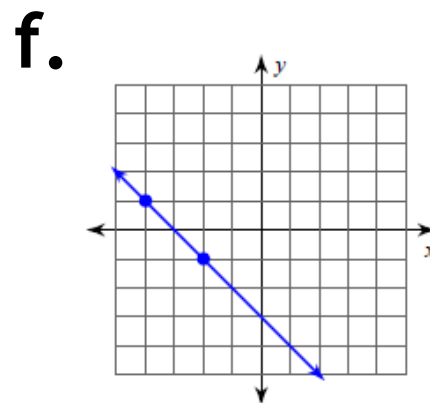


undefined slope/
no slope
(can't \div by 0)

Find the slope of each line.

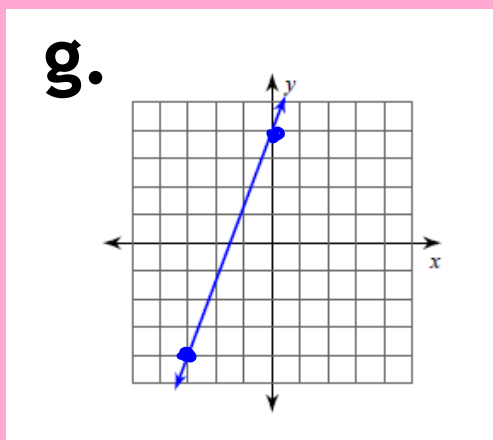


$$m = \frac{1}{2}$$

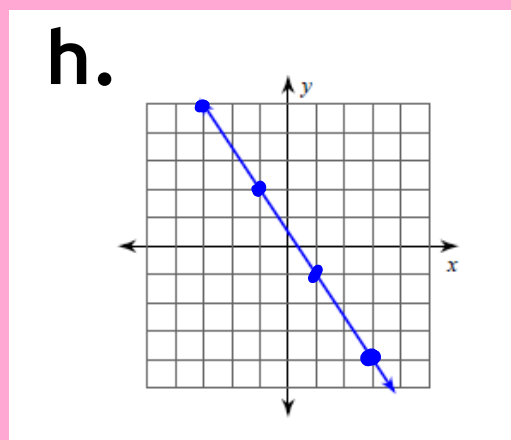


$$m = \frac{-2}{2} = -1$$

Find the slope of each line.



$$m = \frac{8}{3}$$



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

Postulate 17 Slopes of Parallel Lines

In a coordinate plane, two nonvertical lines are parallel if and only if they have the same slope.

Any two vertical lines are parallel.

Postulate 18 Slopes of Perpendicular Lines

Two nonvertical lines are perpendicular if and only if the product of their slopes is -1.

Horizontal lines are perpendicular to vertical lines.

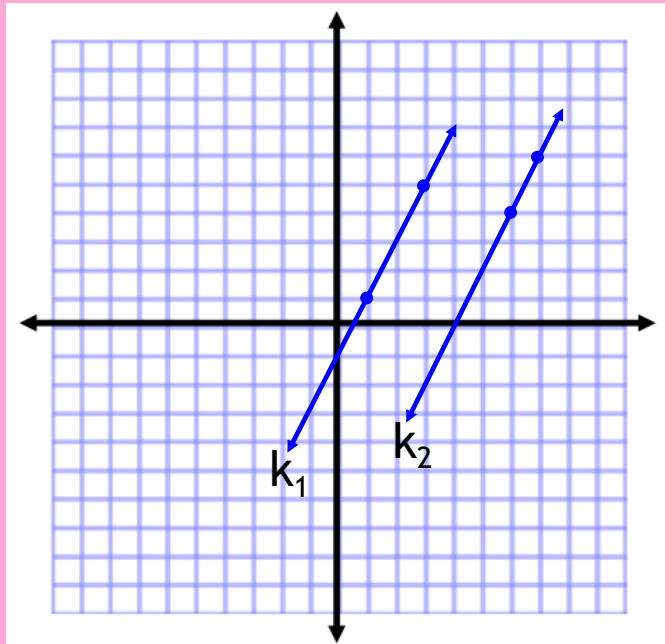
opposite reciprocal slopes

Example 2Find the slope of each line. Is $k_1 \parallel k_2$?

$$k_1 \rightarrow m = \frac{4}{2} = 2$$

$$k_2 \rightarrow m = \frac{2}{1} = 2$$

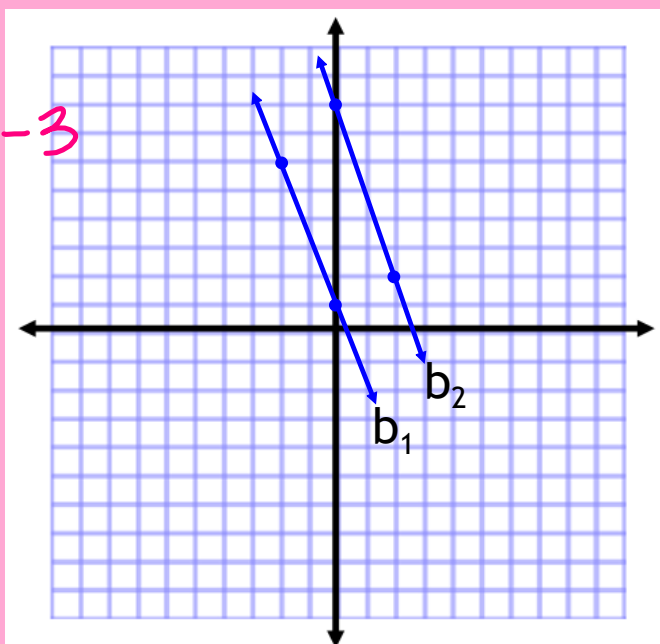
$k_1 \parallel k_2$
b/c
same slope

**Example 3**Find the slope of each line. Is $b_1 \parallel b_2$?

$$b_1 \rightarrow m = -\frac{5}{2}$$

$$b_2 \rightarrow m = -\frac{6}{2} = -3$$

b_1 not $\parallel b_2$
b/c
not same slope



Example 4

Find the slope of each line. Determine if the lines are perpendicular.

perpendicular b/c
slopes are
opposite reciprocals

