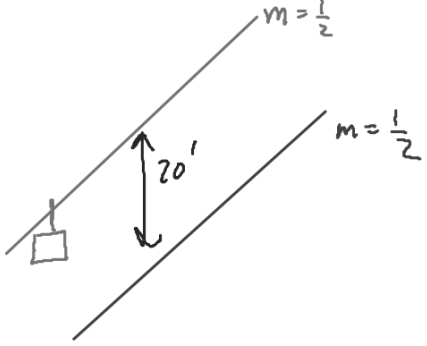
A hill and a gondola line 20 ft above the ground that goes up the hill both have slope $\frac{1}{2}$. What is the geometric relationship between the hill and the gondola line?

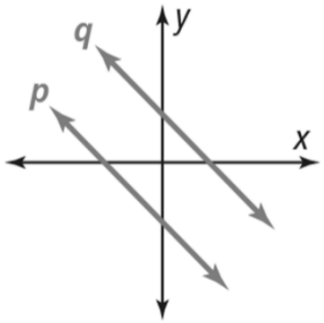


Two non-vertical lines are parallel if and only if their slopes are equal.

Any two vertical lines are parallel.

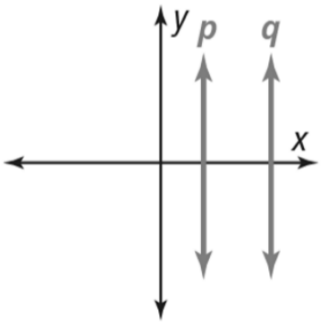
PROOF: SEE LESSON 7-5.

If... p and q are both not vertical



Then... $p \parallel q$ if and only if the slope of line p = slope of line q

If... p and q are both vertical



Then... $p \parallel q$

Find the slope of the line through each pair of points.

1) $(19, -16), (-7, -15)$

$x_1 \quad y_1 \quad x_2 \quad y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-15 - (-16)}{-7 - 19} = \frac{-15 + 16}{} = \frac{1}{-26}$$

2) $(1, -19), (-2, -7)$

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

$$\frac{-7 - (-19)}{-2 - 1} = \frac{12}{-3}$$

$$= -4$$

3) $(-4, 7), (-6, -4)$

$$m = \frac{-4 - 7}{-6 - (-4)} = \frac{-11}{-2} = \frac{11}{2}$$

4) $(20, 8), (9, 16)$

$$\frac{16 - 8}{9 - 20} = \frac{8}{-11}$$

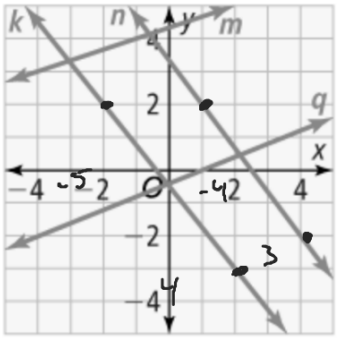
Are lines *k* and *n* parallel?

SOLUTION

$\text{Slope}_k = \frac{-5}{4}$

$\text{Slope}_n = -\frac{4}{3}$

K is not ll to n

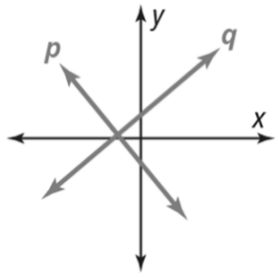


Two non-vertical lines are perpendicular if and only if the product of their slopes is -1.

A vertical line and a horizontal line are perpendicular to each other.

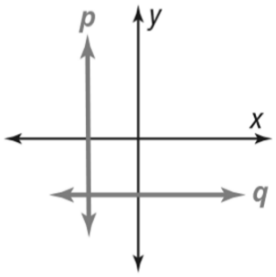
PROOF: SEE LESSON 7-4.

If... p and q are both not vertical



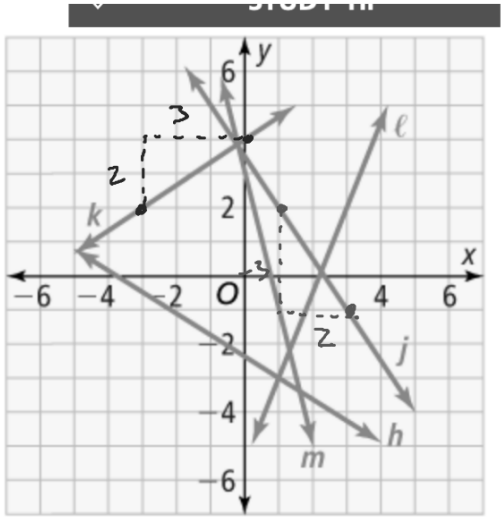
Then... $p \perp q$ if and only if the product of their slopes is -1

If... one of p and q is vertical and the other is horizontal



Then... $p \perp q$

Are lines *j* and *k* perpendicular?



SOLUTION

Slope for $k = \frac{2}{3}$

Slope for $j = \frac{-3}{2}$

$j \perp k$

3. a. Are lines h and ℓ perpendicular?

$h = -\frac{3}{5}$

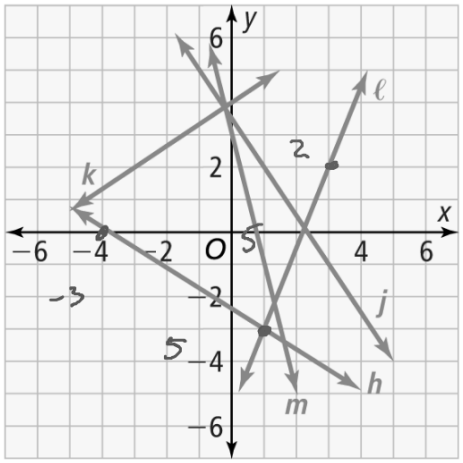
$\ell = \frac{5}{3}$

h not ⊥ to ℓ

CHECK ANSWER

b. Are lines k and m perpendicular?

Enter your answer.



Q 5: Are the lines L1 and L2 passing through the given pairs of points ***parallel***, ***perpendicular*** or ***neither parallel nor perpendicular***?

a. L1: (1 , 2) , (3 , 1) and L2: (0 , -1) , (2 , 0)

$m = \frac{1-2}{3-1} = -\frac{1}{2}$ $\quad \frac{0-(-1)}{2-0} = \frac{1}{2}$

Neither

VL C.3

b. L1: (0 , 3) , (3 , 1) and L2: (-1 , 4) , (-7 , -5)

$m = \frac{1-3}{3-0} = -\frac{2}{3}$ $\quad m = \frac{-5-4}{-7-(-1)} = \frac{-9}{-6} = \frac{3}{2}$

perpe

c. L1: (2 , -1) , (5 , -7) and L2: (0 , 0) , (-1 , 2)