Geometry

Chapter 3
Section 3-8

Rules for Parallel and Perpendicular Lines

- If two nonvertical lines are parallel, then their slopes are equal.
- If the slopes of two distinct nonvertical lines are equal, then the lines are parallel.
- Any two vertical lines are parallel.
- Any two horizontal lines are parallel.

- If two nonvertical lines are perpendicular, then the product of their slopes is -1.
- If the slopes of two lines have a product of -1, then the lines are perpendicular.
- Any horizontal line and any vertical line are perpendicular.

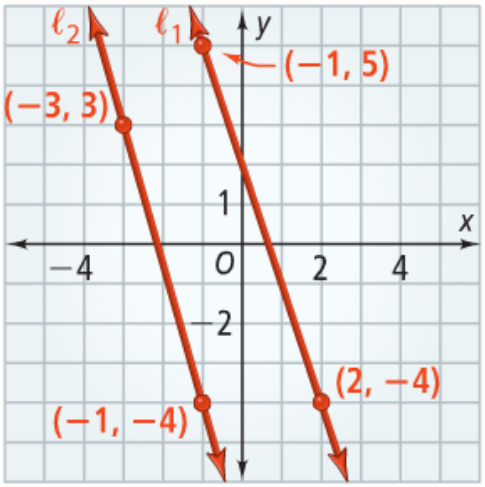
Determining If Lines Are Parallel

Checking for parallel lines:

$$\frac{3 - (-4)}{-3 - (-1)} \qquad \frac{5 - (-4)}{-1 - 2}$$

$$\frac{7}{-2} \qquad \frac{9}{-3}$$

$$-\frac{7}{2} \neq -3$$



Finding an Equation of a Parallel Line

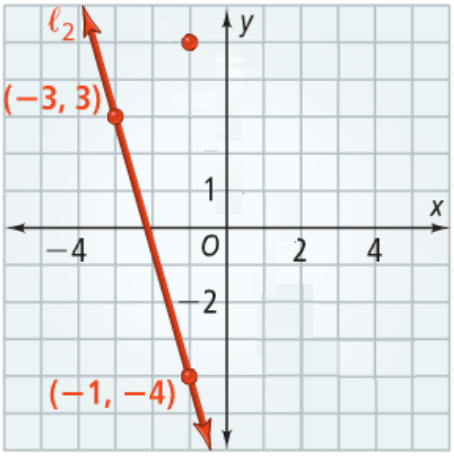
Slope of ℓ_2 was $-\frac{7}{2}$.

Use point-slope formula to write an equation.

$y - y_1 = m(x - x_1)$

$y - 5 = -\frac{7}{2}(x - (-1))$

$y = -\frac{7}{2}x + \frac{3}{2}$



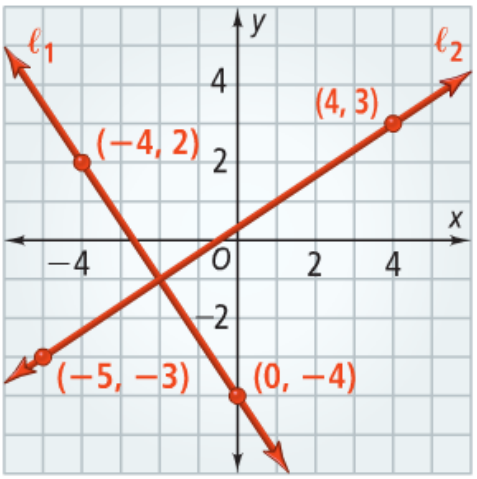
Determining If Lines Are Perpendicular

Checking for perpendicular lines:

$$\frac{2 - (-4)}{-4 - 0} \qquad \frac{3 - (-3)}{4 - (-5)}$$

$$\frac{6}{-4} \qquad \frac{6}{9}$$

$$-\frac{3}{2} \cdot \frac{2}{3} = -1$$



Finding an Equation of a Perpendicular Line

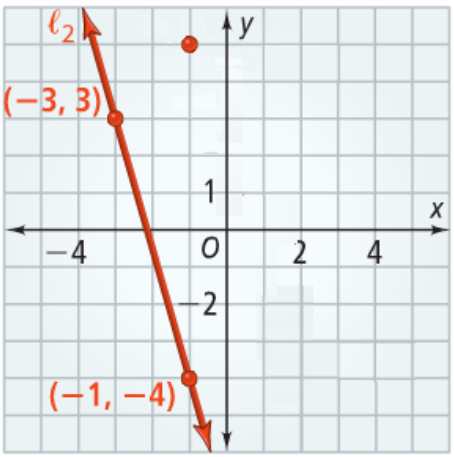
Slope of ℓ_2 was $-{}^{7}/_{2}$.

Use point-slope formula to write an equation.

$y - y_1 = m\,(x - x_1)$

$y - 5 = {}^{2}/_{7}\,(x - (-1))$

$y = {}^{2}/_{7}\,x + {}^{37}/_{7}$



Homework

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