

Transversals – Slopes of Parallel and Perpendicular Lines

Notes Section 3.6

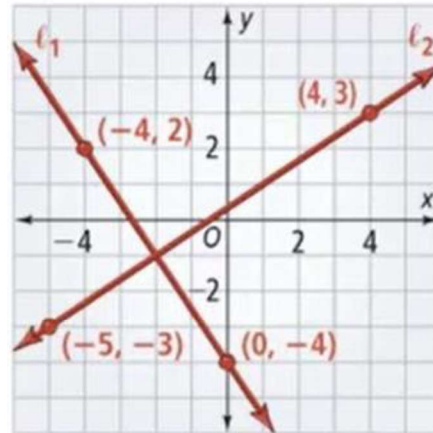
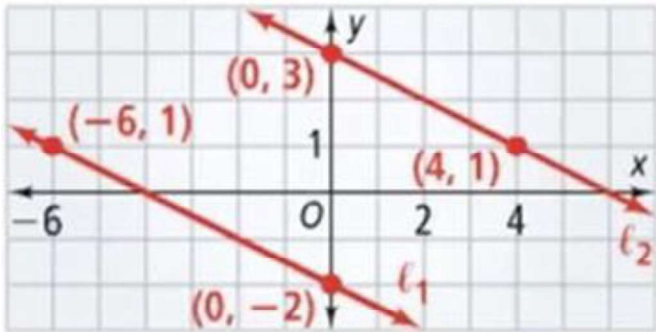
Name _____

Postulate 3.3 – Two nonvertical lines are parallel if they have the same slope

Postulate 3.4 – Two lines are perpendicular if and only if their slopes are negative reciprocals.

Any two vertical lines are parallel and any two horizontal lines are parallel.

Vertical and horizontal lines are perpendicular



1. Write the equation of the line that is parallel to $y = -3x - 5$ and goes through the point $(-1, 8)$

3. Write the equation of a line that is perpendicular to $y = x + 2$ and contains the point $(15, -4)$.

Point	Slope	Point-Slope
$(-1, 8)$	$m = -3$	$y - y_1 = m(x - x_1)$
	$//m = -3$	$y - 8 = -3(x - (-1))$

Point	Slope	Point-Slope
$(15, -4)$	$m = 1$	$y - y_1 = m(x - x_1)$
	$\perp m = -1$	$y - (-4) = -1(x - 15)$

2. Are the following lines parallel? Why or why not?

$3x - y = 6$	$-6x + 2y = 24$
$-y = -3x + 6$	$2y = 6x + 24$
$y = 3x - 6$	$y = 3x + 12$
$m = 3$	$m = 3$

4. Are the following equations perpendicular? Why or why not?

$y = 4x + 8$	$8x - 2y = 10$
$m = 4$	$-2y = -8x + 10$
	$y = 4x + 5$
	$m = 4$

The lines are parallel because they have same slopes.

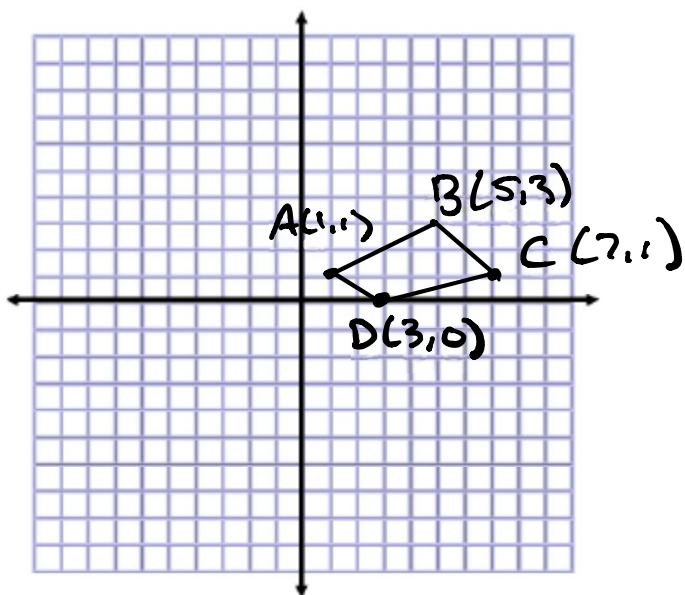
These lines are not \perp because the slopes are not negative reciprocals.

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A rectangle is a quadrilateral that has opposite sides that are parallel and adjacent sides that are perpendicular. Is quadrilateral ABCD a rectangle? Why or why not? A(1,1), B(5,3), C(7,1) and D(3,0)



$$m_{\overline{AB}} = \frac{\Delta y}{\Delta x} = \frac{(1)-(3)}{(1)-(5)} = \frac{-2}{-4} = \frac{1}{2}$$

$$m_{\overline{CD}} = \frac{\Delta y}{\Delta x} = \frac{(1)-(0)}{(7)-(3)} = \frac{1}{4}$$

$$m_{\overline{BC}} =$$

$$m_{\overline{AD}} =$$

Opposite sides are not parallel,
So this is not a rectangle.

Try these... Write the slope-intercept form of the equation of the line described.

5. Through (1, -5) and parallel to $y = -9x$

<u>Point</u>	<u>Slope</u>	<u>Point-Slope</u>
(1, -5)	$m = -9$	$y - y_1 = m(x - x_1)$
	$//m = -9$	$y - (-5) = -9(x - (1))$

6. Through (-3, 2) and perpendicular to $y = 3x - 4$

<u>Point</u>	<u>Slope</u>	<u>Point-Slope</u>
(-3, 2)	$m = 3$	$y - y_1 = m(x - x_1)$
	$\perp m = -\frac{1}{3}$	$y - (2) = -\frac{1}{3}(x - (-3))$