



Parallel & Perpendicular Lines

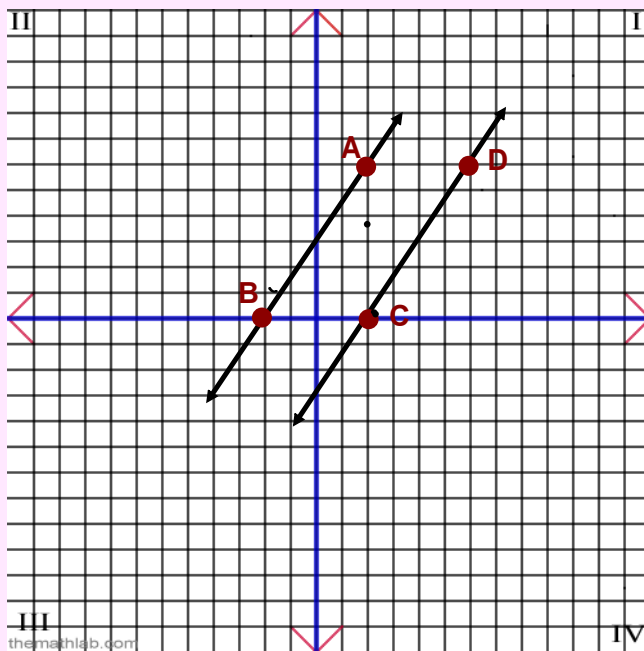




Parallel Lines

Parallel Lines are two lines that are always the same distance apart, and that never intersect.

Parallel Lines



Calculate the slope of segments AB & CD

<i>1st</i>	x_1	y_1	<i>2nd</i>	x_2	y_2	<i>1st</i>	x_1	y_1	<i>2nd</i>	x_2	y_2
	(-2,0)			(2,6)			(2,0)			(6,6)	
AB	$= \frac{y_2 - y_1}{x_2 - x_1}$				CD	$= \frac{y_2 - y_1}{x_2 - x_1}$					
	$m = \frac{6 - 0}{2 - (-2)}$					$m = \frac{6 - 0}{6 - 2}$					
	$m = \frac{6}{2 + 2}$					$m = \frac{6}{4}$					
	$m = \frac{6}{4} = \frac{3}{2}$					$m = \frac{3}{2}$					

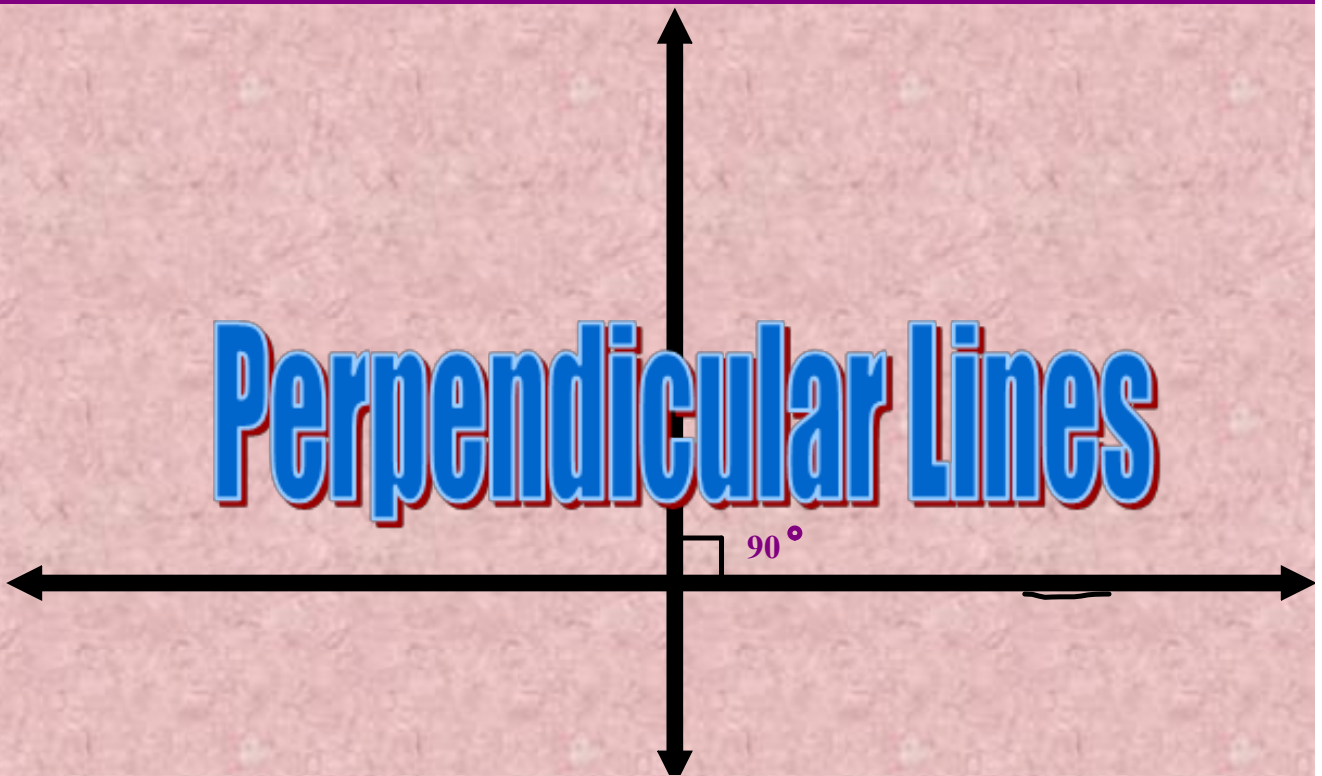
What Do You Notice?

Parallel Slopes are Equal

Slope of AB = Slope of CD, therefore

\overleftrightarrow{AB} is parallel to \overleftrightarrow{CD}

Perpendicular Lines

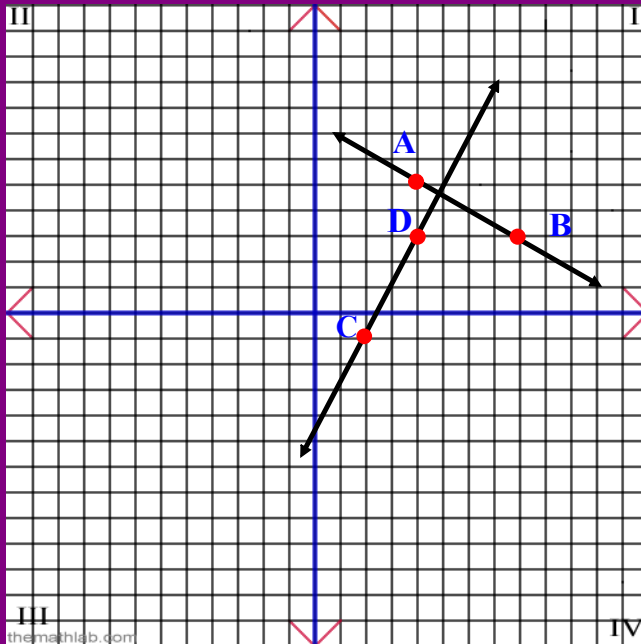


Perpendicular Lines are two lines that intersect to form a 90° angle. (Right Angle)

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Lines

Calculate the slope of
AB & DC



AB 1st (4, 5) 2nd (8, 3)

$$m = \frac{y^2 - y^1}{x^2 - x^1}$$

$$m = \frac{3 - 5}{8 - 4} = \frac{-2}{4} = -\frac{1}{2}$$

CD 1st (2, -1) 2nd (4, 3)

$$m = \frac{y^2 - y^1}{x^2 - x^1}$$

$$\frac{3 - (-1)}{4 - 2} = \frac{3 + 1}{2} = \frac{4}{2} = 2$$

What Do You Notice?

Therefore if the slopes of two lines are

signs



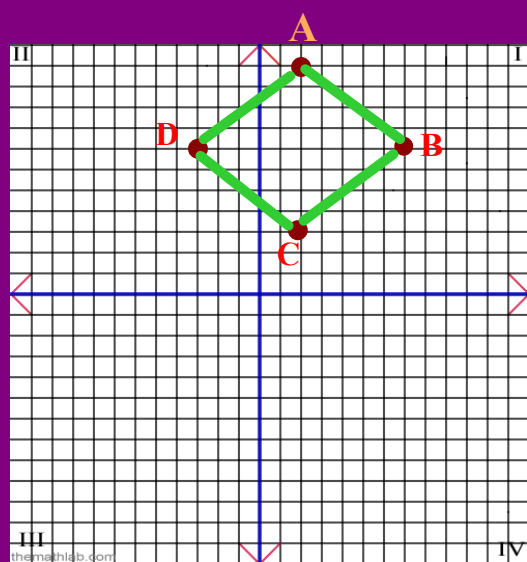
OPPOSITE RECIPROCAL

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

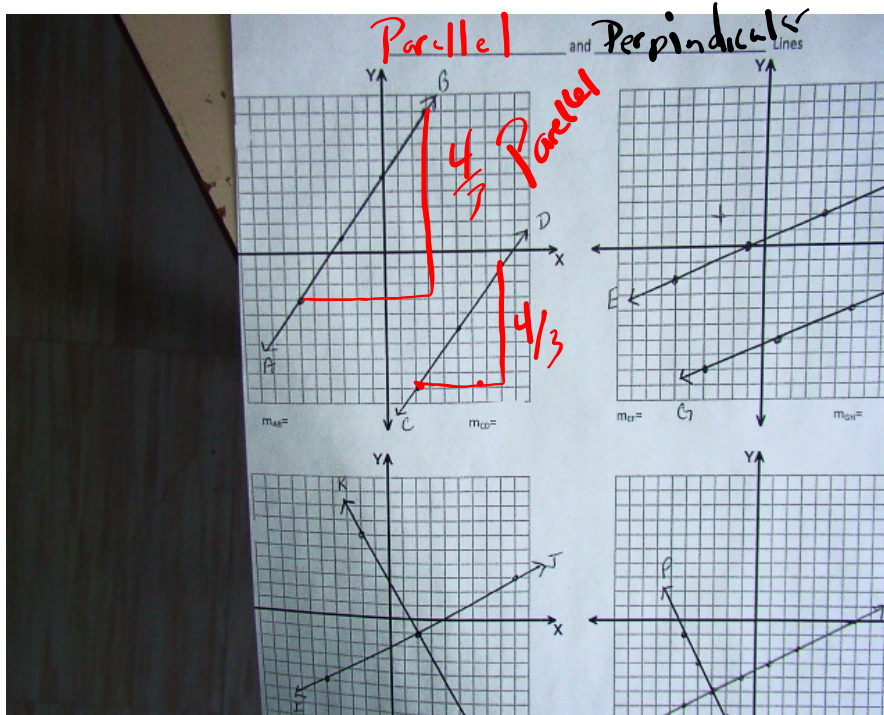
we can say the lines are perpendicular

Therefore AB is perpendicular to DC

Determine whether or not the following figure is a rectangle.



A (2, 11) B (7, 7) C (2, 3) D (-3, 7)



$$AB = \frac{\text{rise}}{\text{run}}$$

$$= \frac{12 \div 3}{9 \div 3} = \frac{4}{3}$$

$$CD = \frac{\text{rise}}{\text{run}}$$

$$= \frac{8 \div 2}{6 \div 2} = \frac{4}{3}$$

Slope of line AB	Slope of line CD	Parallel, Perpendicular or Neither
$m = 5/8$	$m = 5/8$	Parallel lines.
$2/3$	$4/6 = 2/3$	Parallel
$-3/2$	$2/3$	Perpendicular
$1/2$	$-2/1$	Perpendicular
$-5/8$	$5/8$	Neither
$3/7$	$-7/3$	perpendicular
$10/15 = 2/3$	$2/3$	parallel
$-3/5$	$25/15 = 5/3$	perpendicular
$1/3$	$-1/3$	Neither
$3/9 = 1/3$	$1/3$	Parallel
$4/5$	$4/5$	Parallel

Parallel lines
 Slope is the same
) Signs are opposite.
 → reciprocal

#2 State the perpendicular slope for each of the following equations.
 a) $y = 6x - 9$ b) $y = -1/4x - 6$ c) $y =$

Monday K.
 $m = \frac{3}{10}$ (3,4) (6, y^2),

Homework.

Both sheets on parallel and perpendicular.