



Parallel & Perpendicular Lines

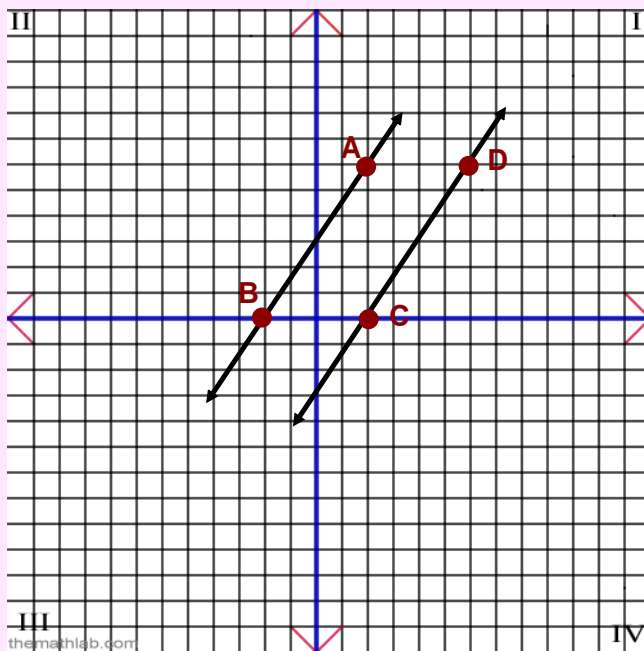




Parallel Lines

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

$$AB = \frac{6-0}{2-(-2)}$$

$$AB = \frac{6-0}{2+2}$$

$$AB = \frac{6}{4}$$

$$AB = \frac{3}{2}$$

$$CD = \frac{6-0}{6-2}$$

$$CD = \frac{6}{4}$$

$$CD = \frac{3}{2}$$

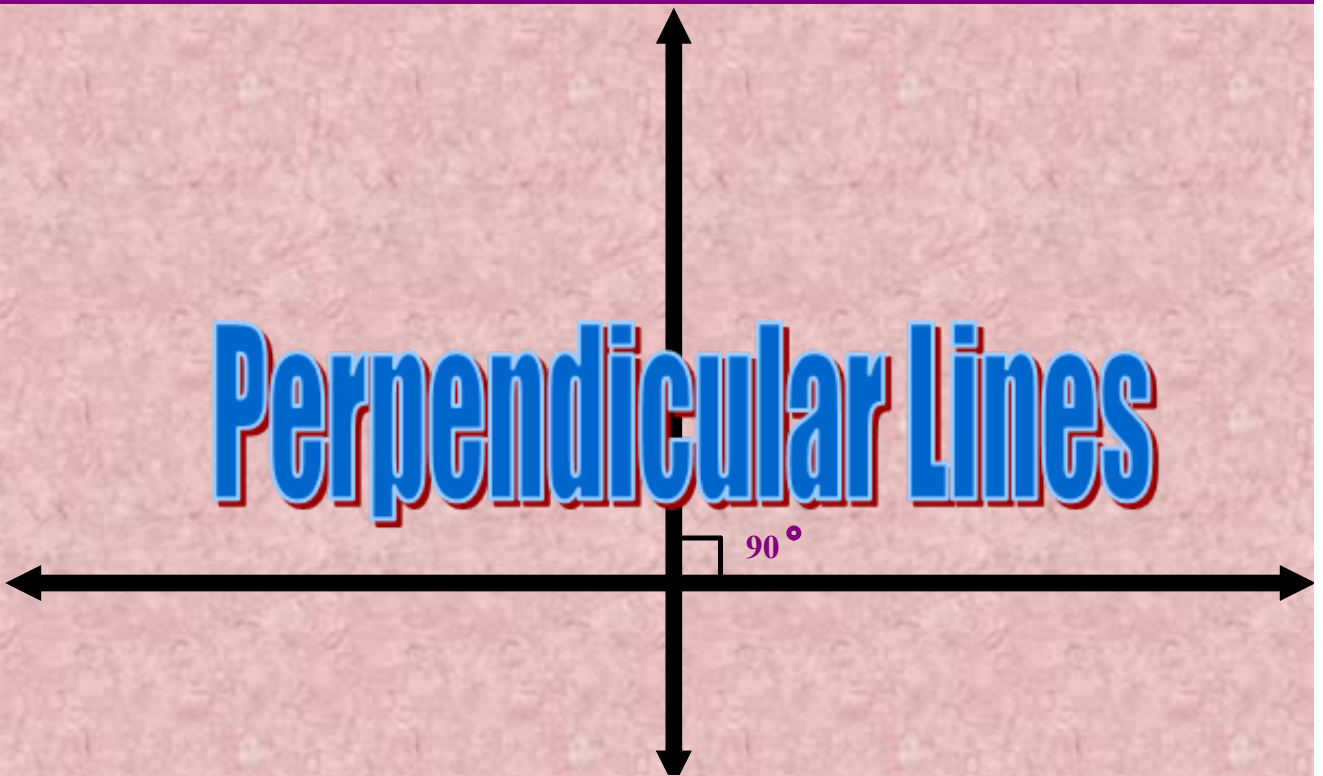
What Do You Notice?

Parallel Slopes are Equal

Slope of AB = Slope of CD, therefore

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

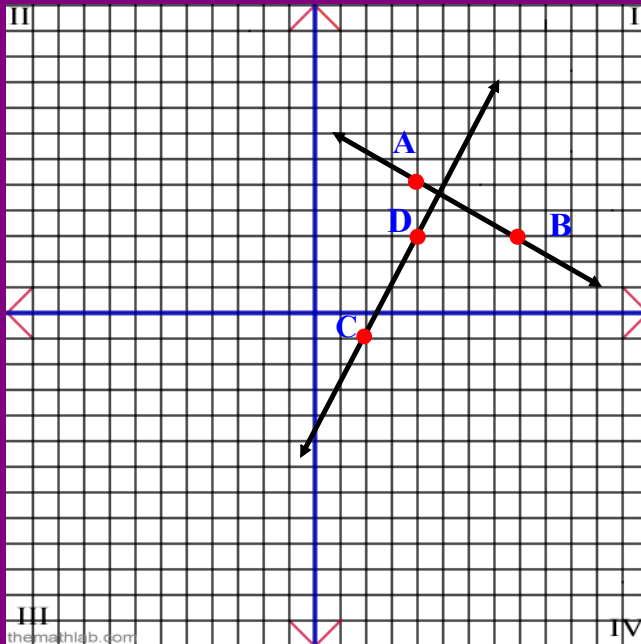
Perpendicular Lines



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

Parallel Lines

Calculate the slope of
AB & DC



AB 1st (x_1, y_1) 2nd (x_2, y_2)
 $(4, 5)$ $(8, 3)$

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

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

$$m = \frac{-2}{4}$$

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

CD 1st (x_1, y_1) 2nd (x_2, y_2)
 $(2, -1)$ $(4, 3)$

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

$$m = \frac{3 + 1}{2}$$

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

$$m = 2$$

What Do You Notice?

Therefore if the slopes of two lines are

OPPOSITE RECIPROCAL

we can say the lines are perpendicular

$$\frac{-1}{2} \quad \downarrow \text{change slope} \quad +\frac{2}{1}$$

Therefore AB is perpendicular to DC