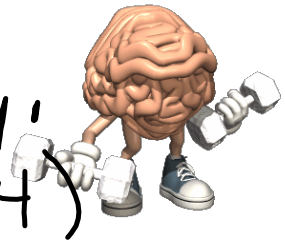
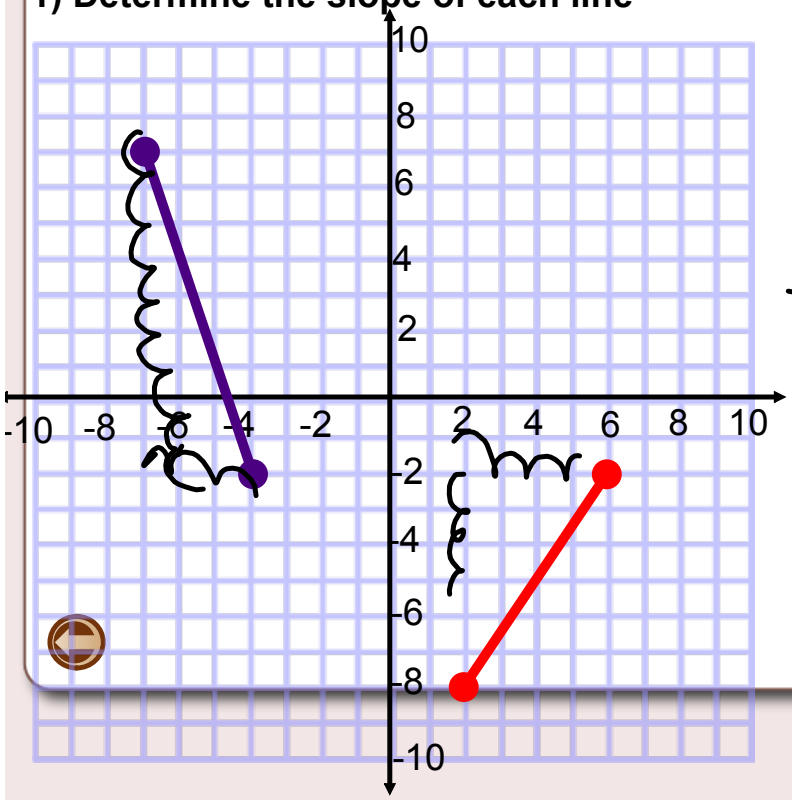
Warm Up



1) Determine the slope of each line



2)What is the slope of a line with points(-3,4) and

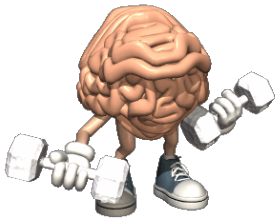
(x_1, y_1) (x_2, y_2)

$(-3, 4)$

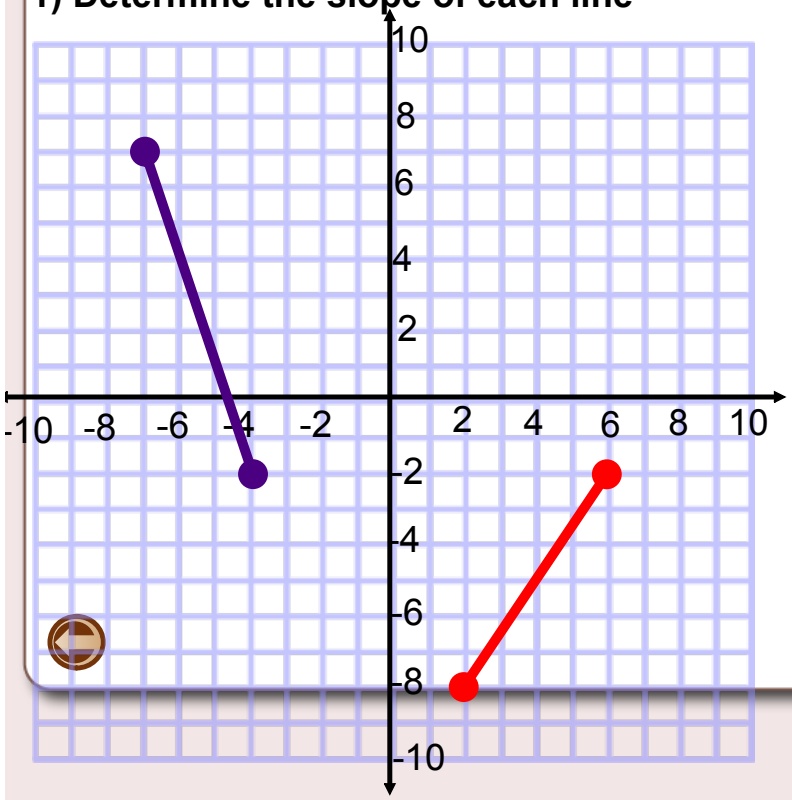
$\frac{y_2 - y_1}{x_2 - x_1}$

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

Warm Up

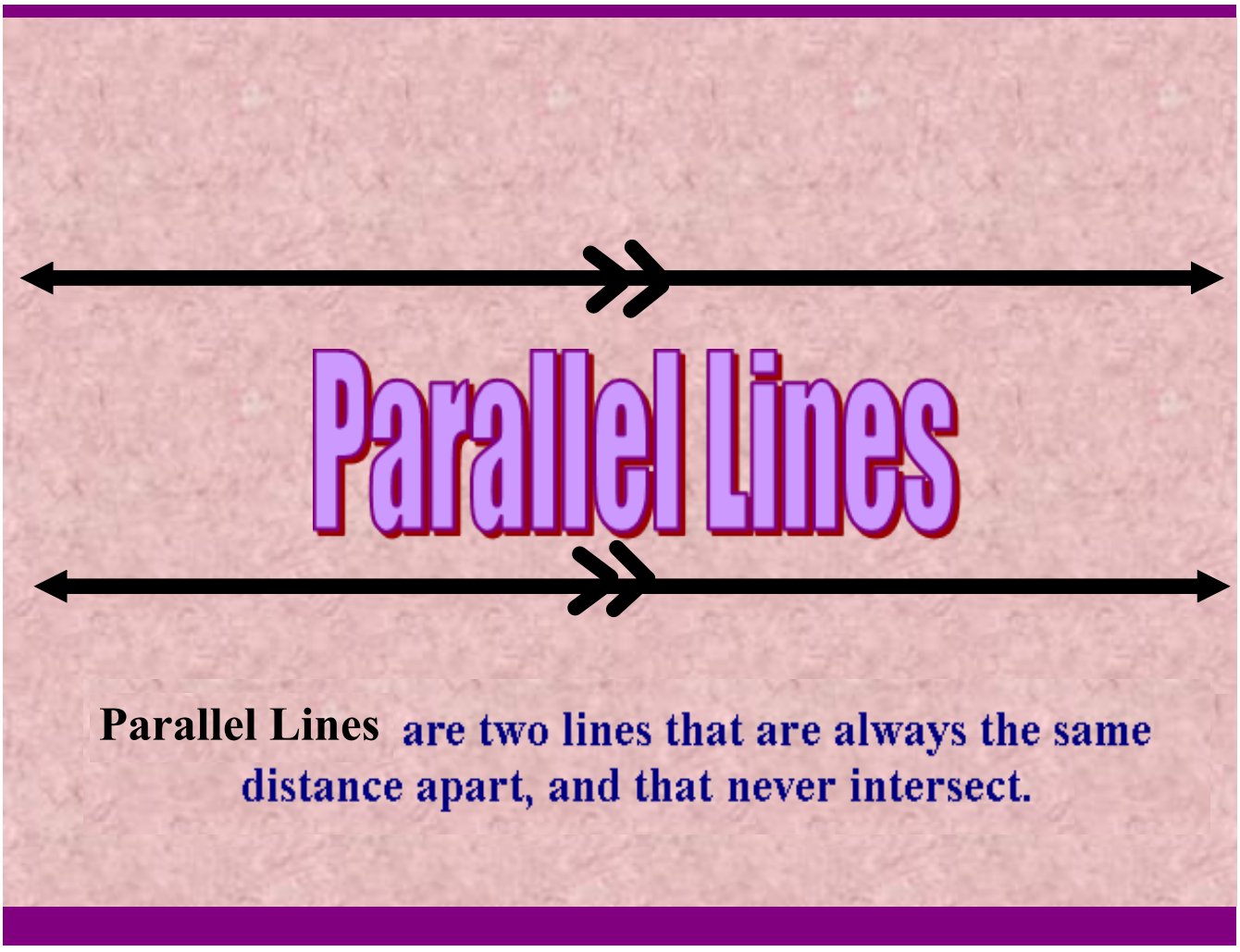


1) Determine the slope of each line

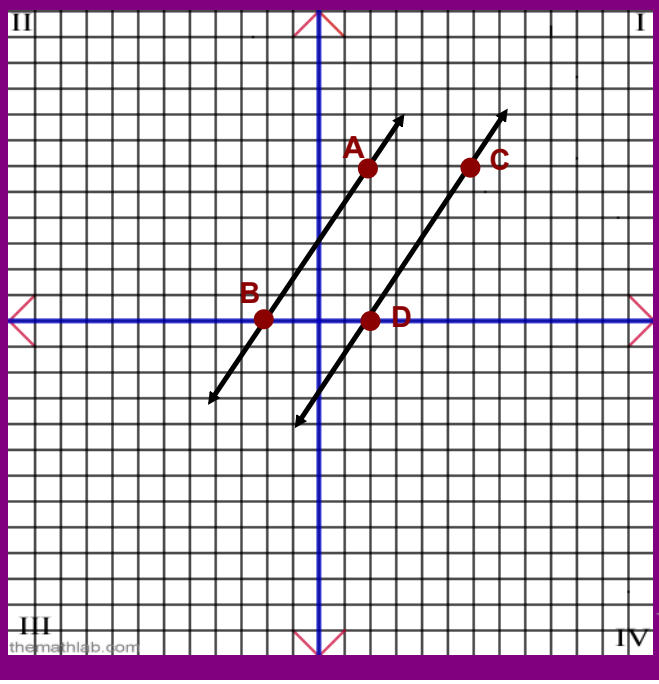


2)What is the slope of a line with points(-3,4) and (11, -1) ?

Parallel & Perpendicular Lines & Collinear Points


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

Parallel Lines



Calculate the slope of AB & DC

1st (X_1, Y_1) 2nd (X_2, Y_2)

$(-2,0)$ $(2,6)$ $(2,0)$ $(6,6)$

$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$ $m_{DC} = \frac{y_2 - y_1}{x_2 - x_1}$

What Do You Notice?

What Do You Notice?

1st (X_1 Y_1) 2nd

$(-2, 0)$ $(2, 6)$

$m_{AB} = \frac{6-0}{2-(-2)} = \frac{6}{4} = \frac{3}{2}$

1st (X_1 Y_1) 2nd (X_2 Y_2)

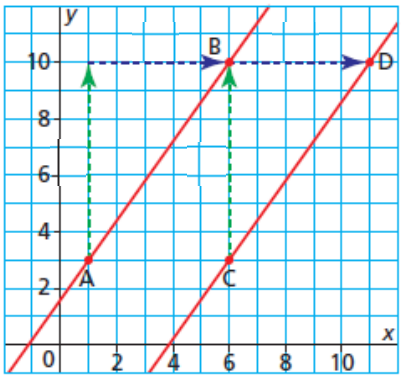
$(2, 0)$ $(6, 6)$

$m_{DC} = \frac{6-0}{6-2} = \frac{6}{4} = \frac{3}{2}$

When two lines have the same slope, congruent triangles can be drawn to show the rise and the run.
Lines that have the some slope are parallel.

Slope of AB = ?

Slope of CD = ?



Recall:

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

?

6.2 Slopes of Parallel and Perpendicular Lines


Slopes of parallel lines are equal

When given an equation y= mx + b

Two lines that are parallel will have the same "m"

Example: y = 3x + 7 & y= 3x +144

1) What is the slope of a line parallel to y= 5x - 6?

m = 5

2) What is the slope of a line parallel to $y = \frac{-6}{7}x - 10$?

$m = -\frac{6}{7}$

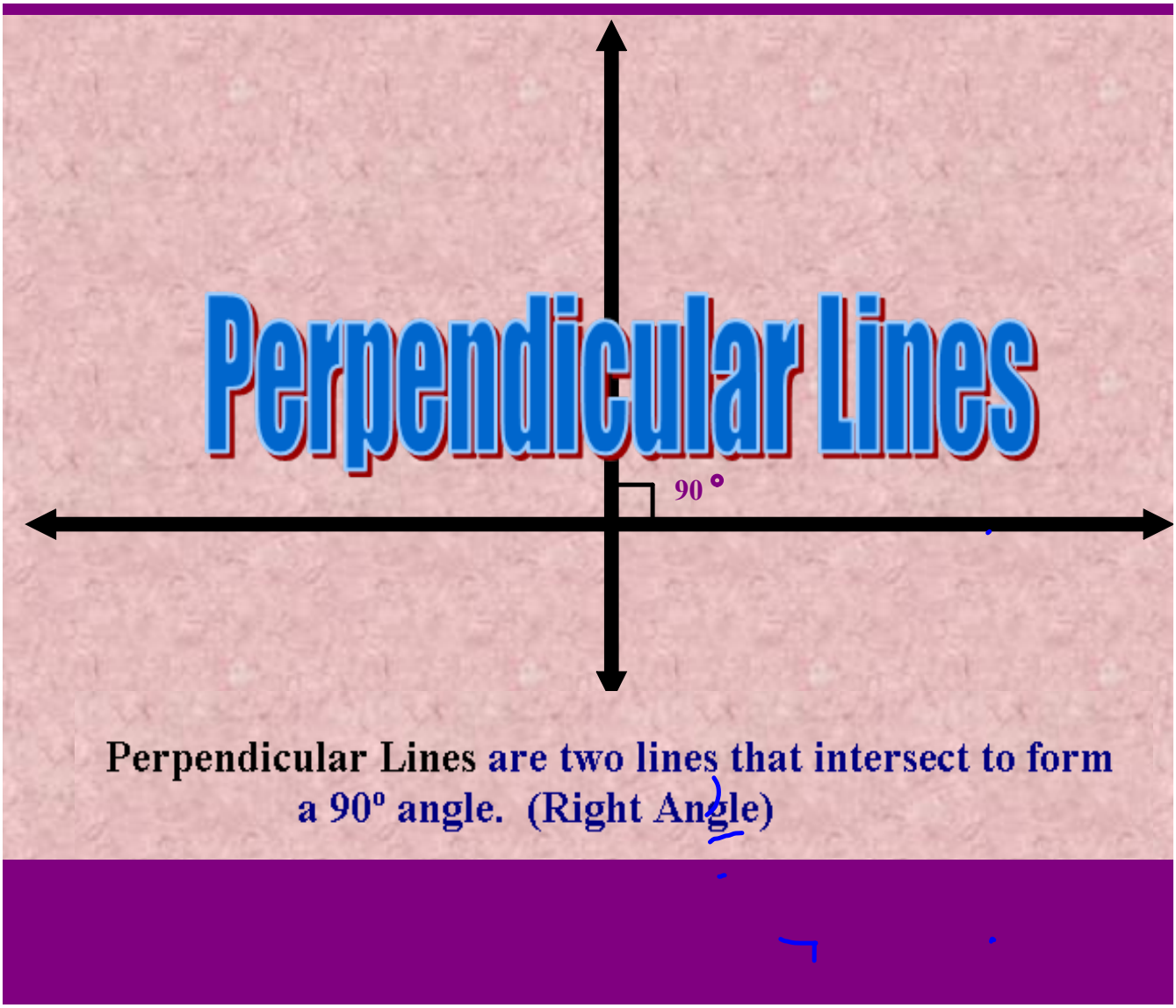
1 What is the slope of a line parallel to AB?

A -2

B $\frac{1}{2}$

C 2

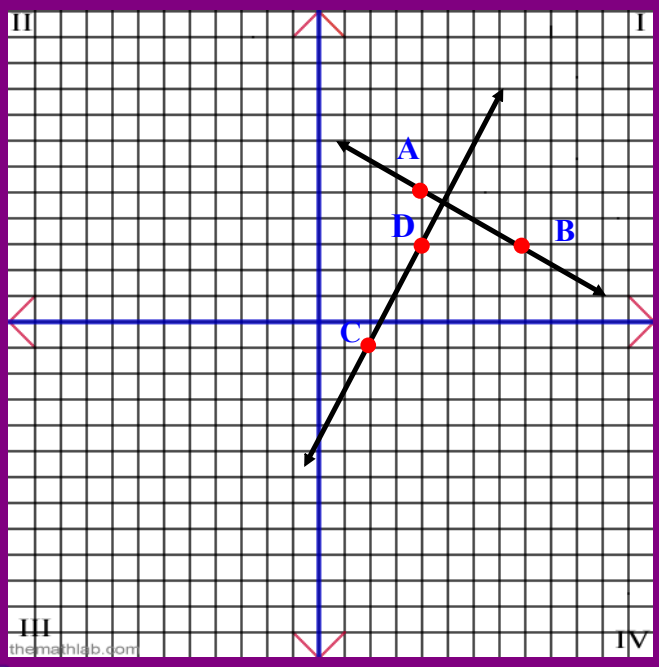
Slope of AB = 2


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

Pre-Calculus

Lines

Calculate the slope of AB & DC



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

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

What Do You Notice?

Perpendicular Lines

Calculate the slope of AB & DC

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

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

$m_{AB} = \frac{3 - 5}{8 - 4}$

$m_{AB} = \frac{-2}{4}$

$m_{AB} = \frac{-1}{2}$

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

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

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

$m_{CD} = \frac{3 - -1}{4 - 2}$

$m_{CD} = \frac{4}{2}$

$m_{CD} = 2$

What Do You Notice?

Therefore if the slopes of two lines are

OPPOSITE RECIPROCALS

we can say the lines are perpendicular

Therefore AB is perpendicular to DC

2 What is the slope of a line perpendicular to AB?

A $\frac{3}{4}$

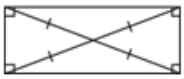
$\frac{4}{3}$

C $-\frac{3}{4}$

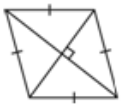
Slope of AB = $-\frac{3}{4}$

Activate Prior Learning:
Properties of Quadrilaterals

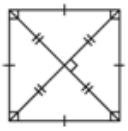
A **rectangle** is a parallelogram with 4 right angles.
It has all the properties of a parallelogram and its diagonals are equal.



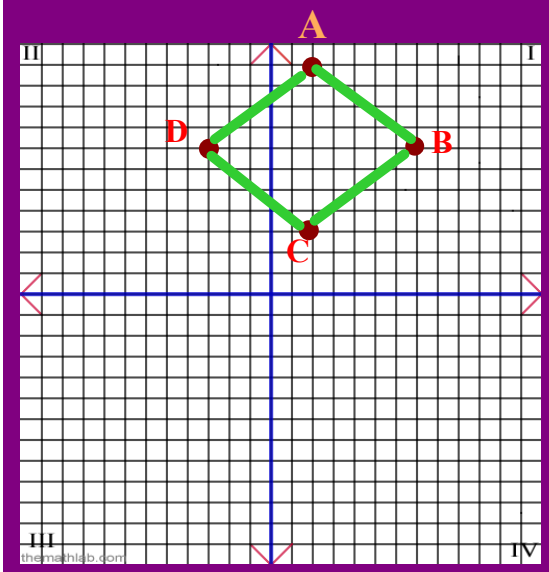
A **rhombus** is a parallelogram with 4 equal sides.
It has all the properties of a parallelogram and its diagonals are perpendicular.



A **square** is a parallelogram with 4 equal sides and 4 right angles.
A square has all the properties of a parallelogram, a rectangle, and a rhombus.



Determine whether or not the following figure is a rectangle.



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

$m_{AB} = -\frac{4}{5}$

$m_{AD} = \frac{5}{4}$

$m_{BC} = \frac{4}{5}$

$m_{CD} = \frac{5}{4}$

No!

When given an equation y= mx + b

Two lines that are perpendicular when their slope are negative reciprocals "m" and (-1/m)

Example: $y = 3x + 7$ & $y = -\frac{1}{3}x + 144$

1) What is the slope of a line Perpendicular to y= 5x - 6?

$m = -\frac{1}{5}$

2) What is the slope of a line perpendicular to $y = \frac{-6}{7}x - 10$?

$m = \frac{7}{6}$

Attachments

Parallel.doc

Perpendicular and Parallel lines.docx