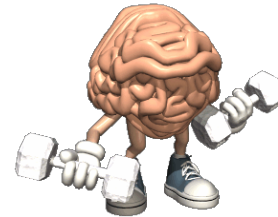
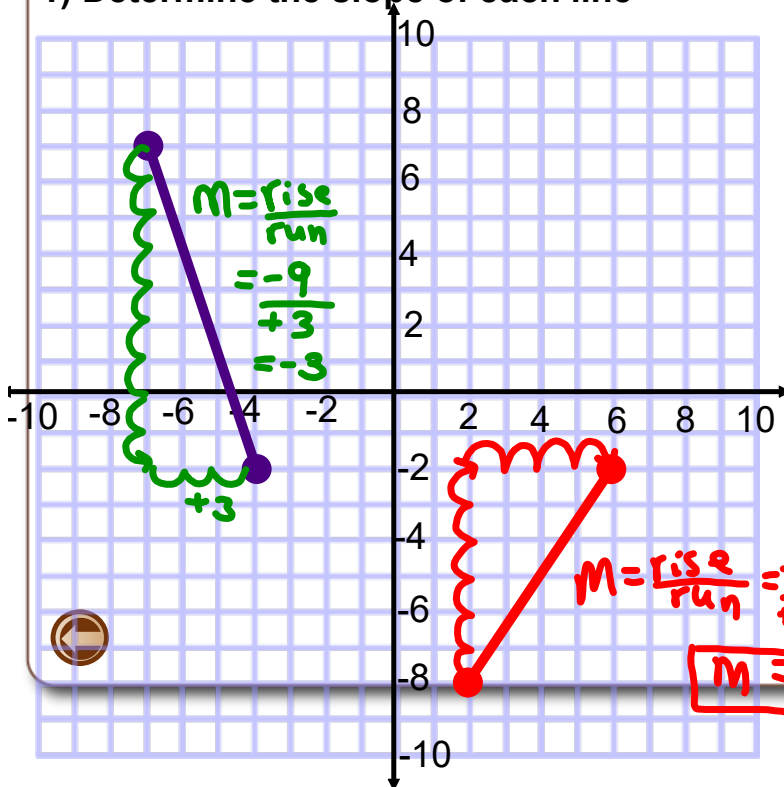


Warm Up



1) Determine the slope of each line



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

3) Given $(8, 4)$ and $(4, y)$ and the slope is $\frac{3}{2}$?

4) Given $(x, 4)$ and $(5, 10)$ and the slope is $\frac{1}{2}$?

Warm Up

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

$$\begin{array}{cc} (-3, 4) & (11, -1) \\ x_1, y_1 & x_2, y_2 \end{array}$$

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

$$= \frac{(-1) - (4)}{(11) - (-3)}$$

OR watch signs

$$= \frac{-5}{11 + 3}$$

$$m = \frac{-5}{14}$$

$$\frac{(4) - (-1)}{(-3) - (11)} = \frac{4 + 1}{-14}$$

$$m = \frac{5}{-14}$$

3) Given (x_1, y_1) and (x_2, y_2)
 and the slope is $\frac{3}{2}$?

Warm Up

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

$$\frac{3}{2} = \frac{y - 4}{4 - 8}$$

$$\frac{3}{2} = \frac{y - 4}{-4}$$

$$-4 \left(\frac{3}{2} \right) = \frac{y - 4}{-4} \quad (-4)$$

$$\underbrace{-\frac{12}{2}}_{\text{Reduce}} = y - 4$$

$$-6 = y - 4$$

$$-6^{+4} = y - 4^{+4}$$

$$\boxed{-2 = y}$$

fill in equation
w/ what is given

4) Given (x_1, y_1) and (x_2, y_2)
 and the slope is $\frac{1}{2}$?

Warm Up

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

$$\frac{1}{2} = \frac{10 - 4}{5 - x}$$

$$\frac{1}{2} = \frac{6}{(5-x)}$$

CROSS
multiply

$$\frac{1}{2} \cdot (5-x) = 6$$

$$(5-x) \cdot \frac{1}{2} = \frac{6}{(5-x)} \cdot (5-x)$$

$$1(5-x) = 2(6)$$

$$5-x = 12$$

$$\frac{(5-x)}{2} = 6$$

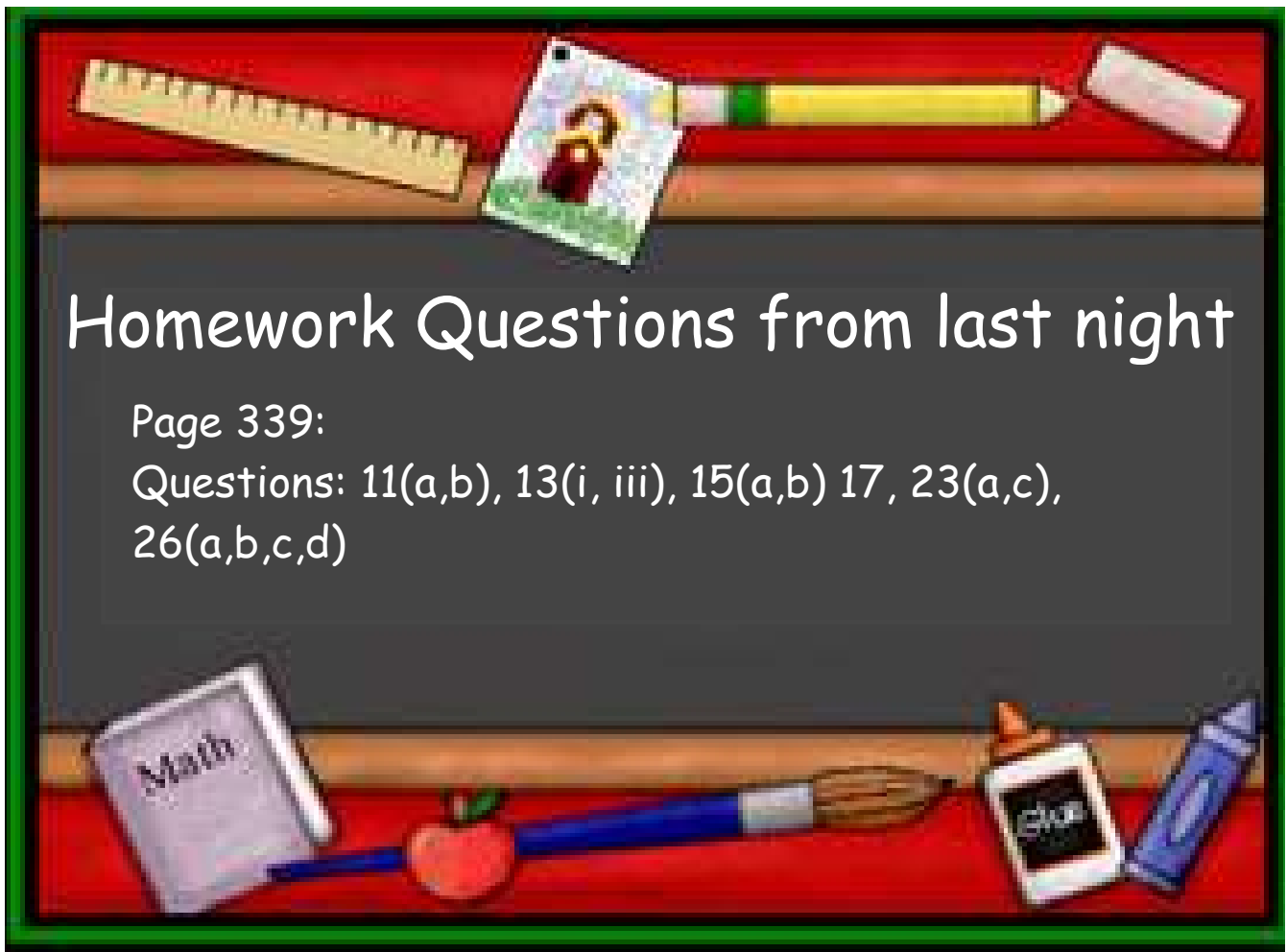
$$2 \cdot \frac{(5-x)}{2} = 6 \cdot 2$$

$$5-x = 12$$

$$5-x = 12-5$$

$$\frac{-x}{-1} = \frac{7}{-1}$$

$$x = -7$$



$$m = \frac{\text{rise}}{\text{run}} \quad \frac{1.50}{10} = 0.15$$

15cents/mess

$$y\text{-int} = b = 0$$

$$y = m x + b$$

$$y = 0.15 x$$

$$c = 0.15 t$$

b) $x = 1$ what $y = ?$

$$c = 0.15(1)$$

$$= 0.15$$

1 message cost 15cent.

c) $c = 0.15 t$

$$= 0.15(33)$$

d) $c = 7.20$ what is $t = ?$

$$c = 0.15 t$$

$$7.20 = 0.15 t$$

$$\frac{7.20}{0.15} = \frac{0.15 t}{0.15}$$

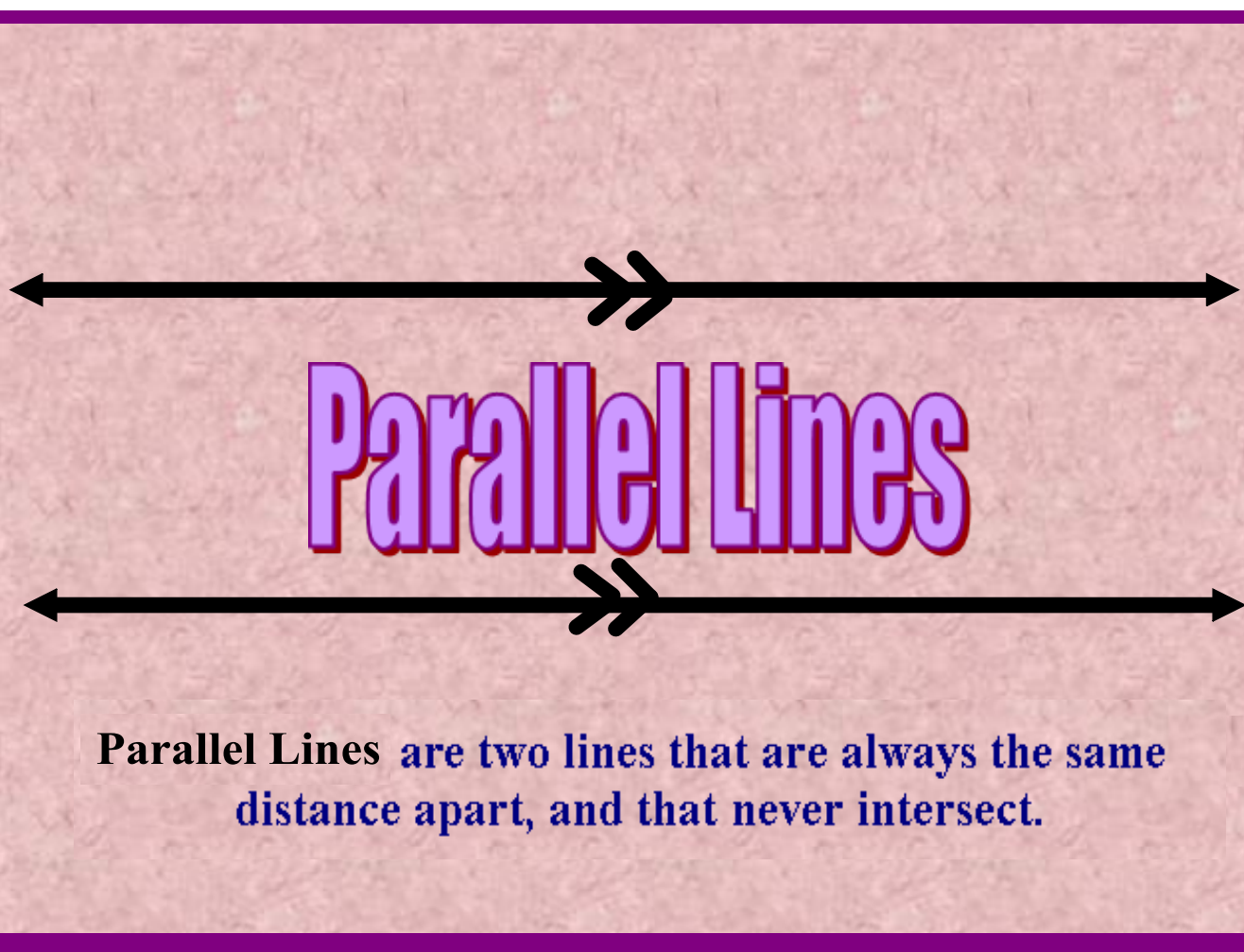
$$= t$$

a) The message either gets sent or doesn't can't connect



Parallel & Perpendicular Lines & Collinear Points



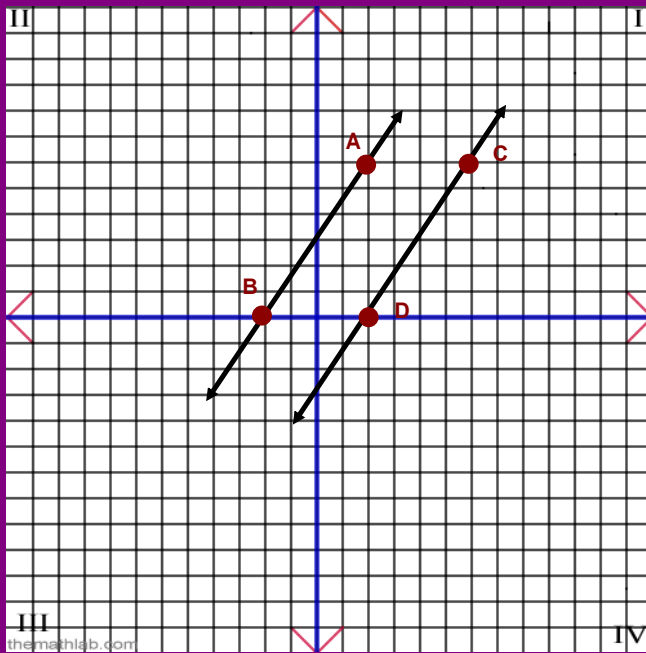


The diagram shows two horizontal black lines on a light pink textured background. Each line has a double arrow pointing to the right in the center, indicating they are parallel. The lines are separated by a consistent distance and do not intersect.

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

$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$	$m_{DC} = \frac{y_2 - y_1}{x_2 - x_1}$
$= \frac{6 - 0}{2 - (-2)}$	$= \frac{6 - 0}{6 - 2}$
$= \frac{6 - 0}{2 + 2}$	$= \frac{6}{4}$
$m_{AB} = \frac{6}{4} = \frac{3}{2}$	$m_{DC} = \frac{3}{2}$

What Do You Notice?

What Do You Notice?

$$\begin{array}{l} \text{1st } x_1, y_1 \quad \text{2nd} \\ (-2, 0) \quad (2, 6) \\ m_{AB} = \end{array}$$

$$\begin{array}{l} \text{1st } x_1, y_1 \quad \text{2nd } x_2, y_2 \\ (2, 0) \quad (6, 6) \\ m_{DC} = \end{array}$$



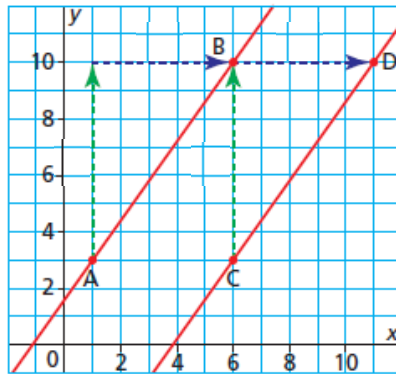
Don't have a copy

When two lines have the same slope, congruent triangles can be drawn to show the rise and the run.

Lines that have the same slope are parallel.

Slope of AB = ?

Slope of CD = ?



Recall:

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

?



Slopes of parallel lines are equal

When given an equation $y = mx + b$

Study

↓
Slope

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

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

$$m = 3$$

$$m = 3$$

//

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

$$m = 5$$

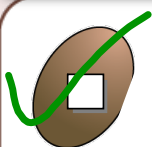
$$m_{//} = 5$$

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

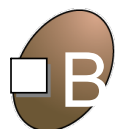
$$m = \frac{-6}{7}$$

$$m_{//} = \frac{-6}{7}$$

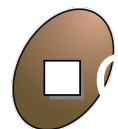
1 What is the slope of a line parallel to AB?



-2



$\frac{1}{2}$



2

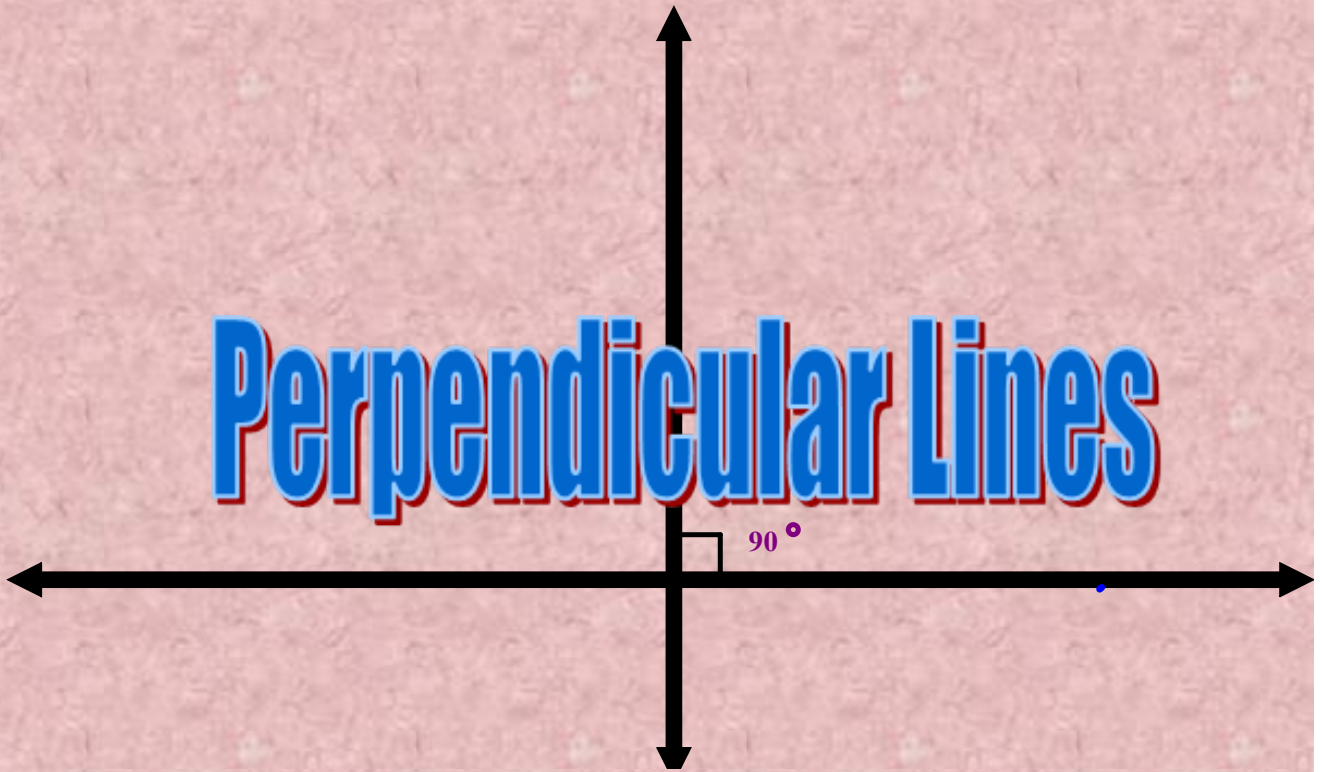


Slope of AB = 2

$$m_{AB} = 2$$

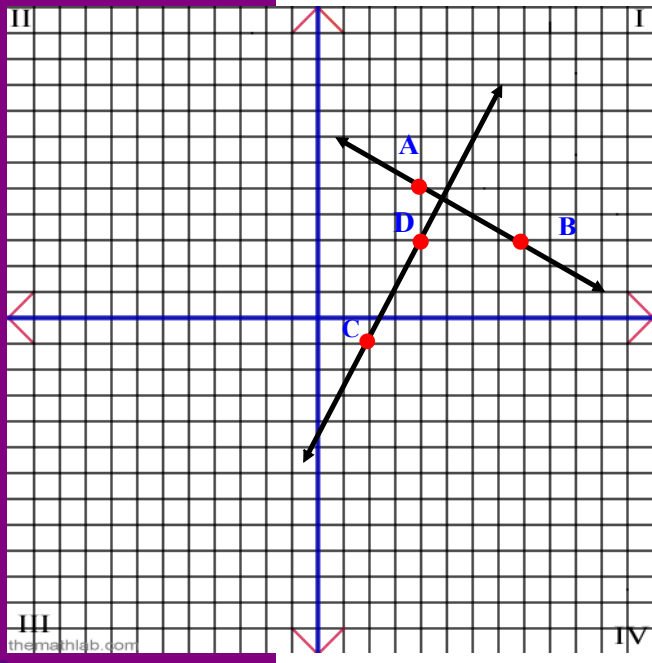
$$m_{\parallel AB} =$$

Perpendicular Lines



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

10-20-25-30-40-50-60-70-80-90-100 Lines



Calculate the slope of AB & DC

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

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

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

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

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

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

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

What Do You Notice?

Calculate the slope of
AB & DC

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

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

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

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

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

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?

Study

Therefore if the slopes of two lines are

OPPOSITE RECIPROCAL

→ flip fraction
→ opposite signs

we can say the lines are perpendicular

Therefore AB is perpendicular to DC

$m = -3$ perpendicular to m

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

A

$$\frac{3}{4}$$

B

$$\frac{4}{3}$$

C

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



⊥

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

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

$$m_{\perp AB} = +\frac{4}{3}$$

Activate Prior Learning: Properties of Quadrilaterals

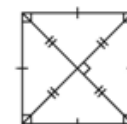
A **rectangle** is a parallelogram with 4 right angles. It has all the properties of a parallelogram and its diagonals are equal.



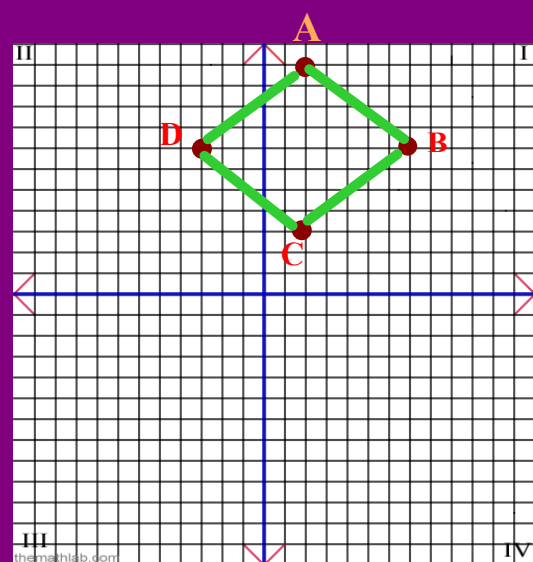
A **rhombus** is a parallelogram with 4 equal sides. It has all the properties of a parallelogram and its diagonals are perpendicular.



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)

When given an equation $y = mx + b$

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

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

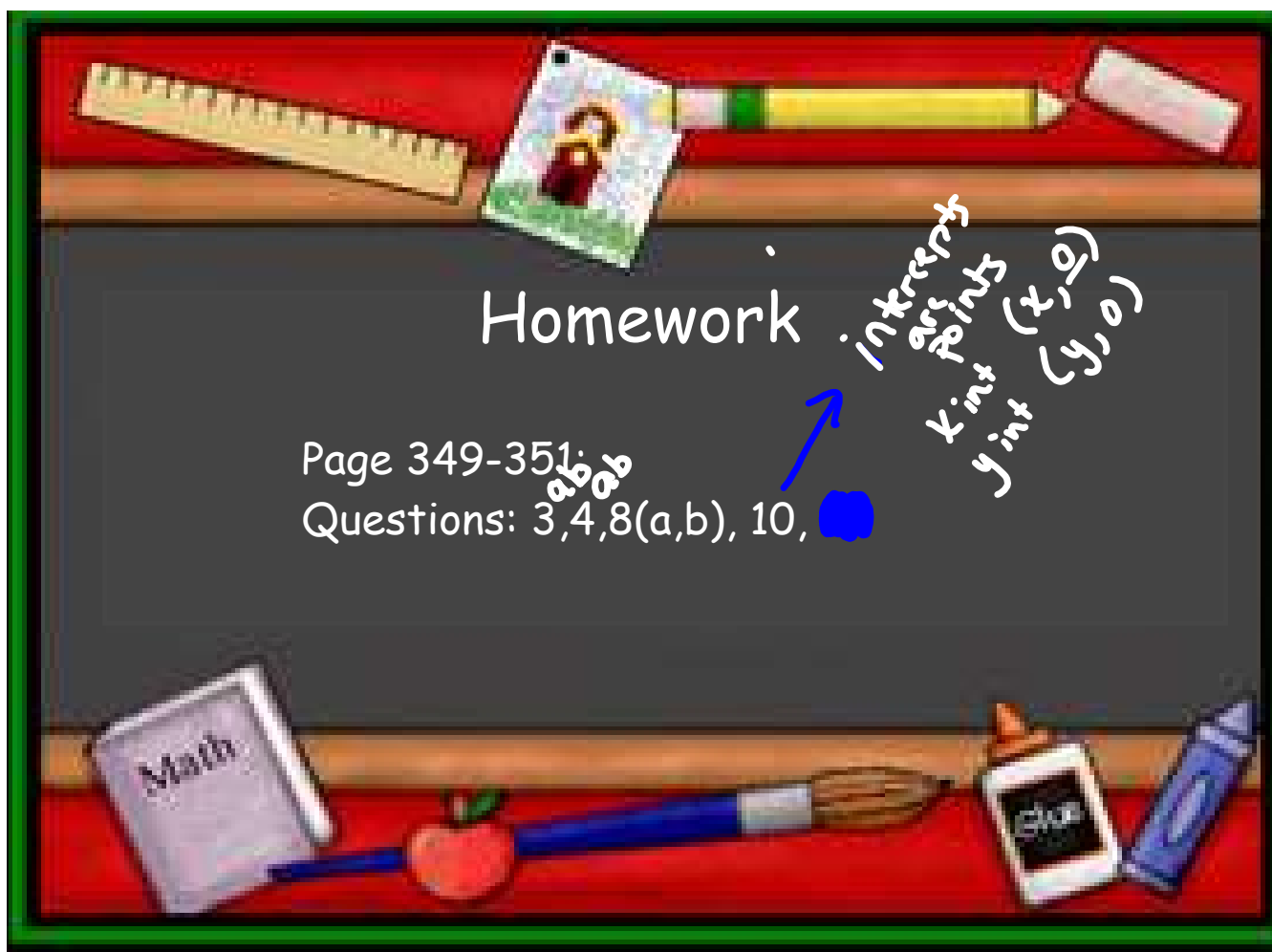
$m = 3$ $m = -\frac{1}{3}$
 ← opposite reciprocals →
 so \perp

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

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

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

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



Attachments

Parallel.doc

Perpendicular and Parallel lines.docx