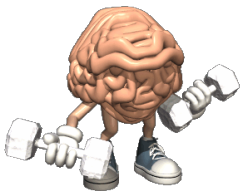
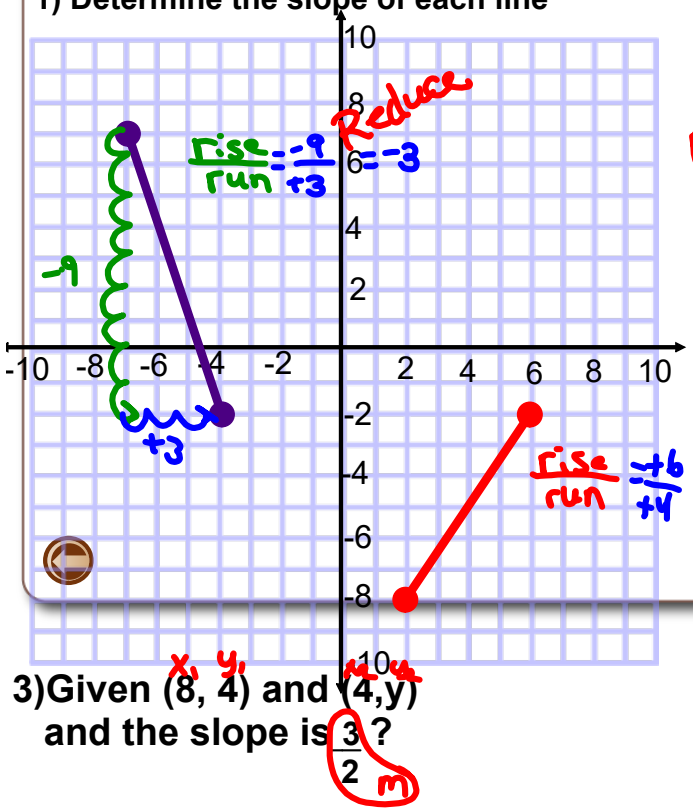
Warm Up



1) Determine the slope of each line



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

$x_1\ y_1$ $x_2\ y_2$

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

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

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

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

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

$x_1\ y_1$ $x_2\ y_2$

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

$\frac{3}{2} = \frac{y-4}{4-8}$ Do any math that can be done.

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

$\frac{-12}{2} = y-4$

$-6 = y-4$

$-6+4 = y-4+4$

$-2 = y$

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

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

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

$\frac{1}{2} = \frac{6}{5-x}$ only for frac = frac

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

$5-x = 12$ -5 -5

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

$x = -7$

Why Cross multiply works with frac = frac

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

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

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

$$\frac{3}{x} = \frac{7}{4}$$

$$7x = 3(4)$$
$$7x = 12$$
$$x = \frac{12}{7}$$

Warm Up

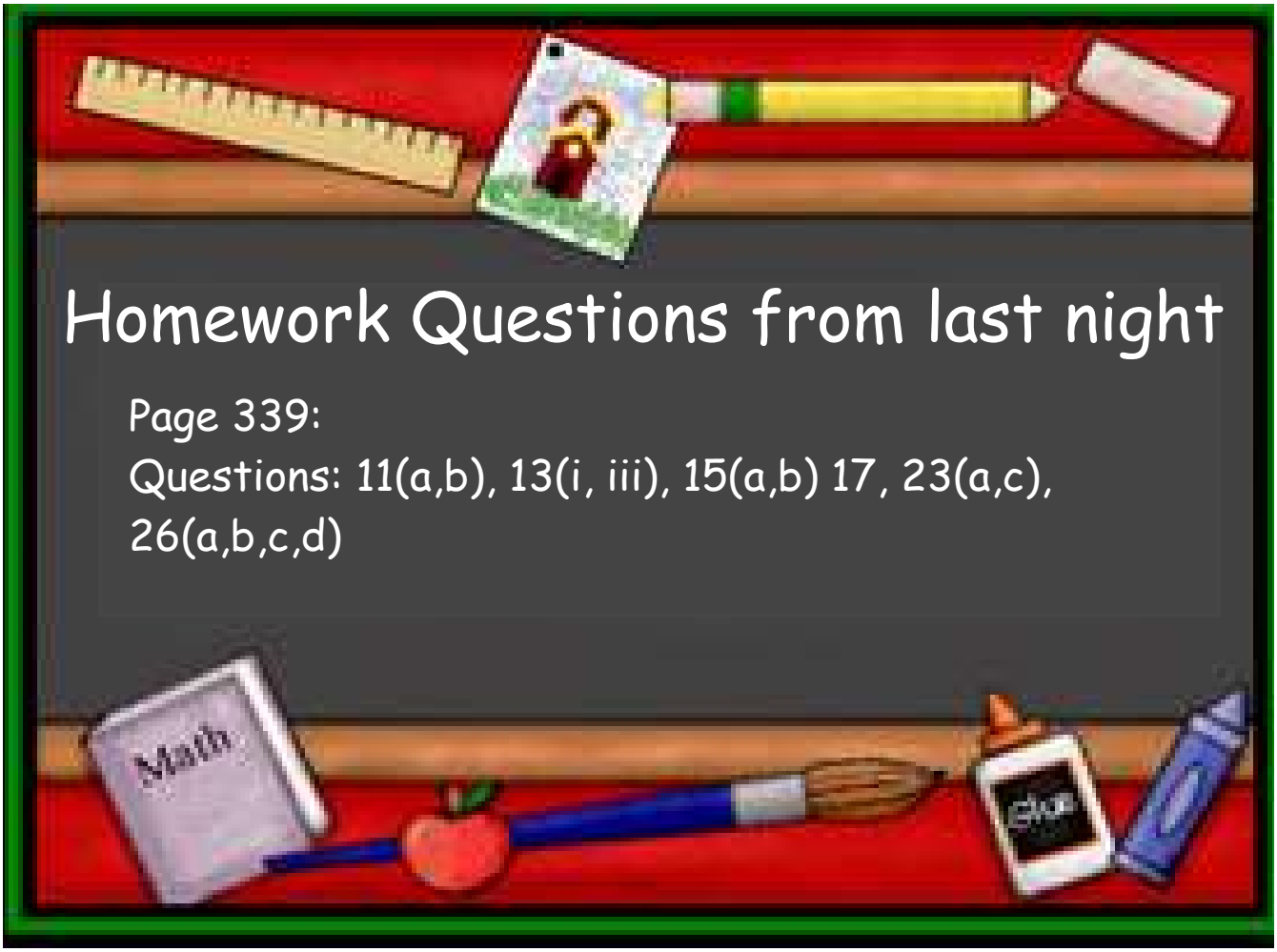
2)What is the slope of a line with points(-3,4) and (11, -1) ?

Warm Up

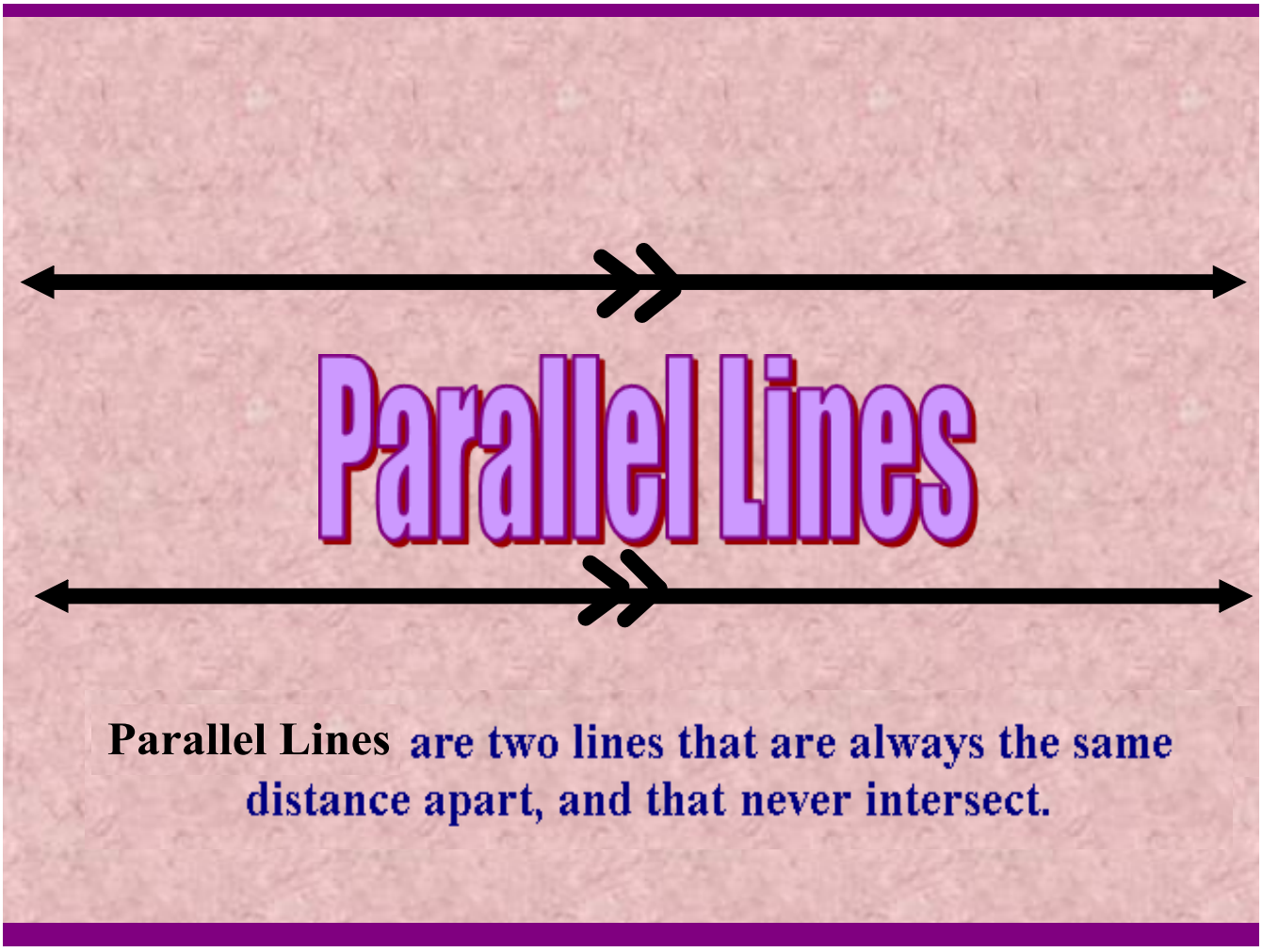
3)Given (8, 4) and (4,y) and the slope is $\frac{3}{2}$?

Warm Up

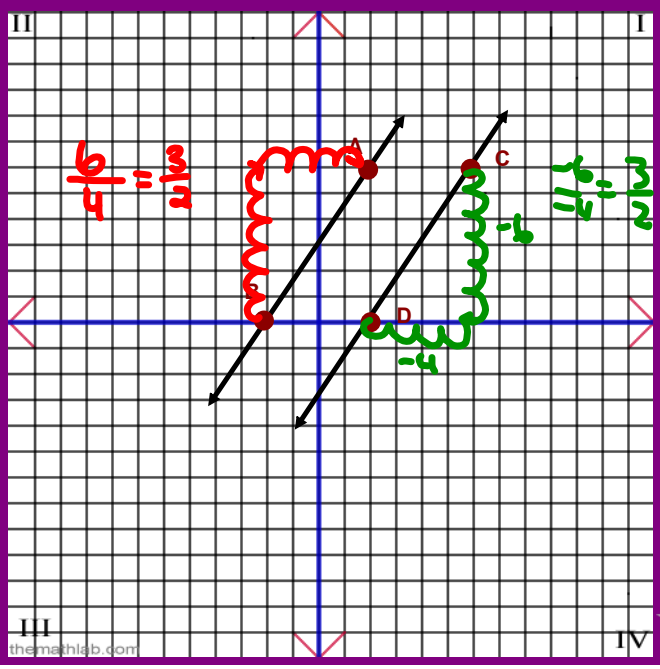
4)Given (x, 4) and (5, 10) and the slope is $\frac{1}{2}$?


Homework Questions from last night
Page 339:
Questions: 11(a,b), 13(i, iii), 15(a,b) 17, 23(a,c), 26(a,b,c,d)
Math
Glue

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)

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

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

Do on next page

What Do You Notice?

What Do You Notice?

1st (x_1, y_1) 2nd

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

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

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

$= \frac{6}{2+2}$

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

1st (x_1, y_1) 2nd (x_2, y_2)

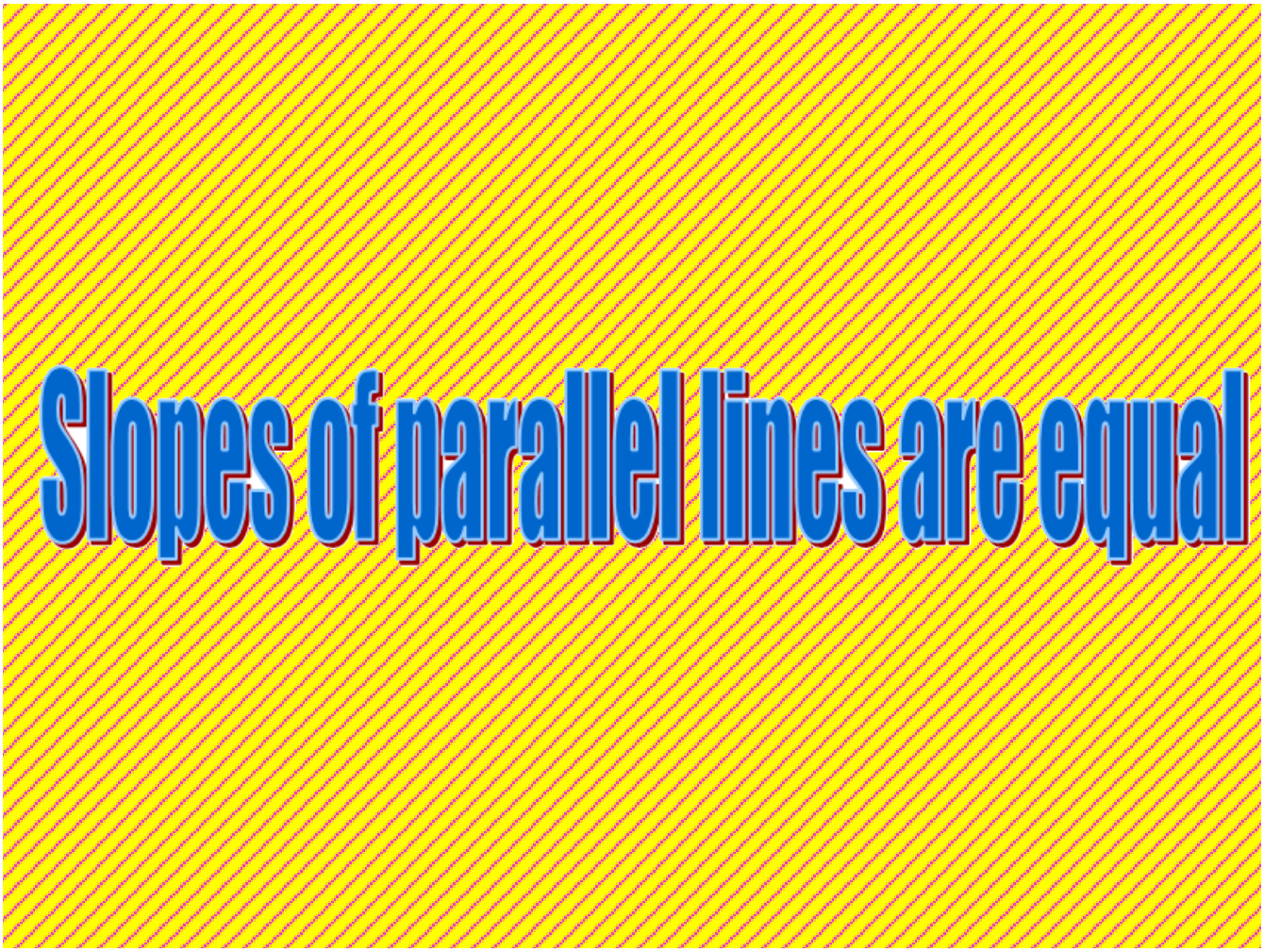
$(2, 0)$ $(6, 6)$

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

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

$= \frac{6}{4}$

$= \frac{3}{2}$


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

are parallel because both have m=3

$m_{//}$ means Slope parallel

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?

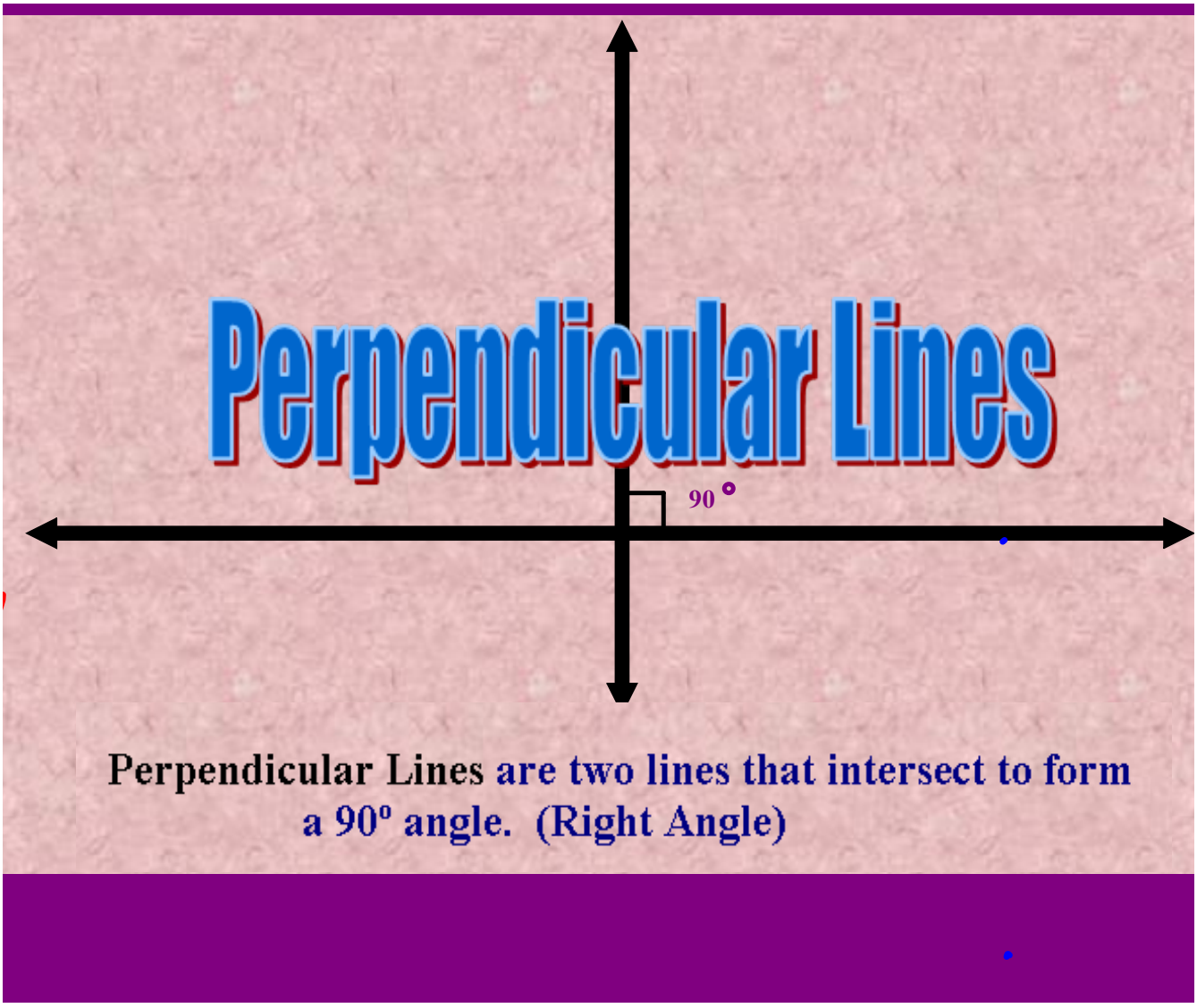
A -2

B $\frac{1}{2}$

C 2

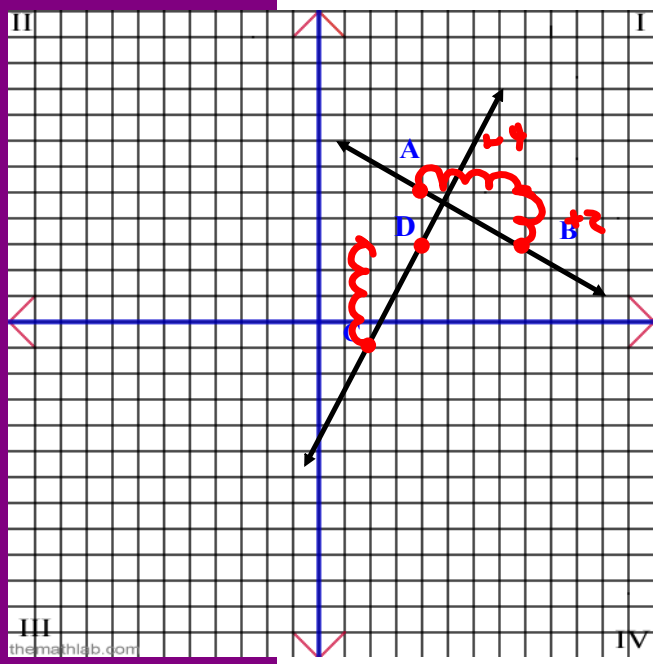
Slope of AB = 2

$m_{\parallel}$ has to be exact same


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

Parallel & Perpendicular Lines

Calculate the slope of AB & DC



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

$\frac{\text{rise}}{\text{run}} = \frac{+2}{4} = -\frac{1}{2}$

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

$\frac{4}{2} = \frac{2}{1}$

What Do You Notice?

Perpendicular Lines

Calculate the slope of AB & DC

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

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

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

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

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

flipped

opposite sign

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

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

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

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

$m_{CD} = 2$

$\frac{}{1}$

What Do You Notice?

Therefore if the slopes of two lines are

→ fraction for slope is flipped and change sign. + −

OPPOSITE RECIPROCALS

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 $-\frac{3}{4}$

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

$m_{AB} = \frac{-3}{4}$ flip and change sign

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

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= -1x +144

$m_\perp$ means slope perpendicular

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

$m_\perp = -\frac{1}{3}$

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

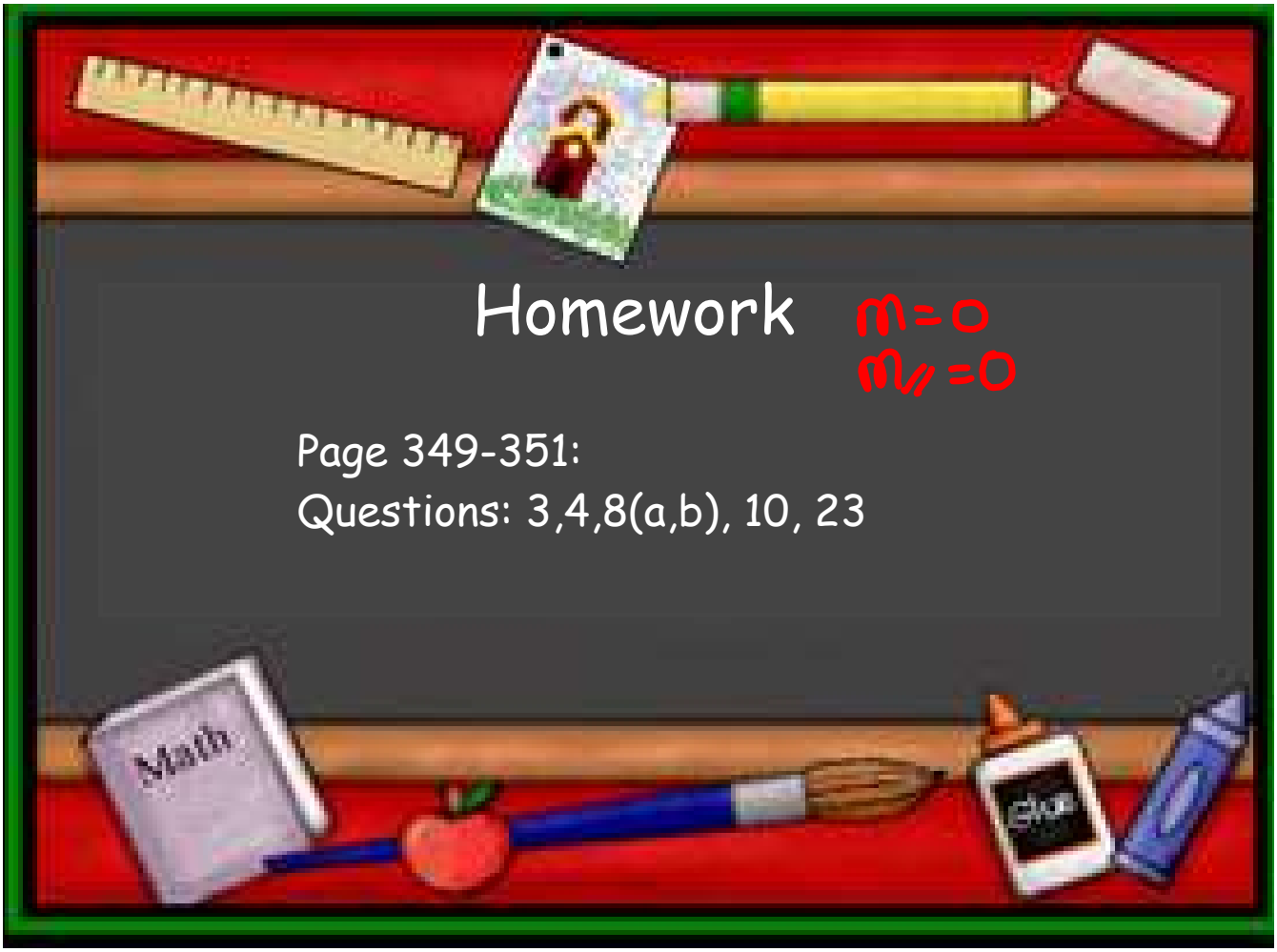
$m = \frac{5}{1}$

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

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

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

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


Homework
m=0
m// =0
Page 349-351:
Questions: 3,4,8(a,b), 10, 23
Math
glue

Attachments

Parallel.doc

Perpendicular and Parallel lines.docx