

PLAN

1. MHS Homework
2. Review Question
3. Parallel and Perpendicular Lines
4. Practice

Sep 23-4:33 PM

Day 2, 4, 7, 9 now in C-130

Sep 23-4:50 PM

QUIZ #2 Thursday Sept 27

Test #2 Thursday Oct 11

Sep 23-4:43 PM

Find the slope, y-intercept and x-intercept

1. $y = 0.5x + 2$
2. $y = 0.5x + 2$
3. $2x + 4y = 0$

$0.5x + 2 = 0$
 $0.5x = -2$
 $x = -4$

$6x + 2x = \frac{12}{12}$
 $8x = 1$
 $x = \frac{1}{8}$

$0.5x + 2 = 0$
 $0.5x = -2$
 $x = -4$

$2x + 4y = 0$
 $2x = -4y$
 $x = -2y$

$0.5x + 2 = 0$
 $0.5x = -2$
 $x = -4$

$2x + 4y = 0$
 $2x = -4y$
 $x = -2y$

Sep 23-4:26 PM

PARALLEL LINES

Parallel lines will never meet
Their slopes are the same
 $a_1 = a_2$

Ex: Find the rule of the linear function passing through $A(3,1)$ and parallel to the line $y = \frac{2}{3}x + 6$

$y = a_1x + b$
 $y = 2x + b$
 $1 = 2(3) + b$
 $1 = 6 + b$
 $1 - 6 = b = -5$

$l_1: y = -\frac{3}{4}x + 12$
 $l_2 = -\frac{3}{4}x + b$

Aug 30-11:35 AM

PERPENDICULAR LINES

Perpendicular lines meet at a 90° angle
The product of their slopes is -1

$y = 2x + 4$
 $y = -\frac{1}{2}x - 2$

Slope = negative reciprocal

Find the negative reciprocal of the following slopes

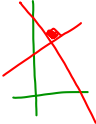
$3x \rightarrow -\frac{1}{3}x \quad (3)(-\frac{1}{3}) = -1$
 $\frac{2}{3}x \rightarrow -\frac{3}{2}x \quad (\frac{2}{3})(-\frac{3}{2}) = -1$
 $-7/2x \rightarrow \frac{2}{7}x \quad (-\frac{7}{2})(\frac{2}{7}) = -1$
 $\frac{1}{1}x \rightarrow -\frac{1}{1}x = -x$

Aug 30-11:35 AM

Ex: Find the rule of the linear function passing through $A(6, -5)$ and perpendicular to the line $y = 1/2x + 4$

$l_1 = y = \frac{1}{2}x + 4$

$l_2 = y = -\frac{2}{1}x + B$



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

$-5 = -12 + B$

$-5 + 12 = B$

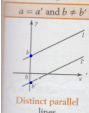
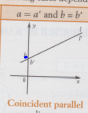
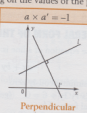
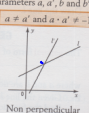
$B = 7$

$y = -2x + 7$

$y = -2x + 7$

Sep 23-4:22 PM

RELATIVE POSITION OF TWO LINES IN FUNCTIONAL FORM

| RELATIVE POSITION OF TWO LINES | | | |
|---|---|---|---|
| Given two lines $l: y = ax + b$ and $l': y = a'x + b'$. We distinguish the following cases depending on the values of the parameters a, a', b and b' . | | | |
| $a = a' \text{ and } b \neq b'$ | $a = a' \text{ and } b = b'$ | $a \times a' = -1$ | $a \neq a' \text{ and } a \times a' \neq -1$ |
|  |  |  |  |
| Distinct parallel lines | Coincident parallel lines | Perpendicular lines | Non perpendicular intersecting lines |

ex:

In each case determine the relative position of l_1 and l_2 .




a) $l_1: y = 2x + 1$
 $l_2: y = 2x - 3$ } Distinct Parallel

b) $l_1: y = 2/3x + 1$
 $l_2: y = -3/2x - 1$ } Perpendicular

$\frac{2}{3} \times -\frac{3}{2} = -1$

Sep 15-1:46 PM

RELATIVE POSITION OF TWO LINES IN GENERAL FORM

| RELATIVE POSITION OF TWO LINES | | |
|---|--|--|
| Given two lines $l: ax + by + c = 0$ and $l': a'x + b'y + c' = 0$. The relative position of the lines l and l' is determined by comparing the ratios $\frac{a}{a'}, \frac{b}{b'}$ and $\frac{c}{c'}$. | | |
| $\frac{a}{a'} = \frac{b}{b'} \neq \frac{c}{c'}$ | $\frac{a}{a'} = \frac{b}{b'} = \frac{c}{c'}$ | $\frac{a}{a'} \neq \frac{b}{b'}$ |
|  |  |  |
| intersecting lines | distinct parallel lines | coincident parallel lines |

ex:

In each of the following cases indicate the relative position of l_1 and l_2 .

a) $l_1: 2x + 6y + 6 = 0$
 $l_2: 3x + 9y + 9 = 0$

$\frac{2}{3} = \frac{6}{9} = \frac{6}{9}$

$y = \frac{1}{3}x + \frac{2}{3}$

b) $l_1: 2x + 3y - 6 = 0$
 $l_2: 3x + 4.5y + 9 = 0$

$\frac{2}{3} = \frac{4.5}{9} = \frac{4.5}{9}$

$y = \frac{1}{3}x + 2$

c) $l_1: 2x + 3y - 3 = 0$
 $l_2: 3x - 2y + 6 = 0$

Sep 15-1:35 PM

$2x + 3y - 6 = 0$

$2x - 6 = -3y$

$\frac{2x - 6}{-3} = \frac{-3y}{-3}$

$y = -\frac{2}{3}x + 2$

$3x + 4.5y + 9 = 0$

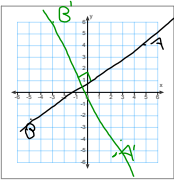
$3x + 9 = -4.5y$

$\frac{3x + 9}{-4.5} = \frac{-4.5y}{-4.5}$

$y = -\frac{3}{4.5}x + \frac{2}{4.5}$

Sep 25-10:34 AM

Given $A(5, 4), B(5, -2)$ and $A'(3, -4), B'(3, 6)$, four points on the Cartesian plane. What can be said about lines AB and $A'B'$? Justify your answer.



$A(5, 4), B(5, -2)$

$A'(3, -4), B'(3, 6)$

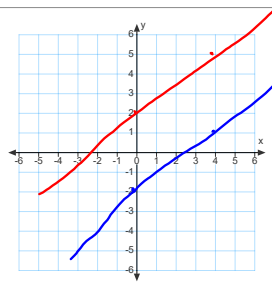
$a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 4}{3 - 5} = \frac{-6}{-2} = \frac{3}{1}$

$a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-4)}{3 - 3} = \frac{10}{0}$

$\frac{3}{1} = \frac{10}{0}$

Aug 30-1:27 PM

Given $A(0, -2), B(4, 1)$ and $A'(0, 2), B'(4, 5)$, four points on the Cartesian plane. What can be said about lines AB and $A'B'$? Justify your answer.



$a = \frac{1 - (-2)}{4 - 0} = \frac{3}{4}$

$a = \frac{5 - 2}{4 - 0} = \frac{3}{4}$

Aug 30-11:41 AM

$y = ax + b$ REVIEW

Find the rule of the linear equation with points $(2, 10)$ and $(4, -6)$

x_1, y_1 x_2, y_2

$$a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - 10}{4 - 2} = \boxed{-8}$$


$y = -8x + b$

$10 = -8(2) + b$

$+16$
 $10 = \boxed{-16} + b$

$10 + 16 = b = 26$

$y = -8x + 26$



Sep 23-4:29 PM