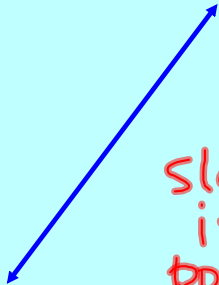
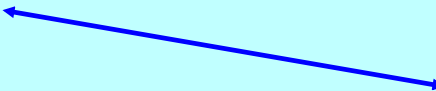


# Review


## Slope & the Equation of a Line

What can you say about the slope of these lines?

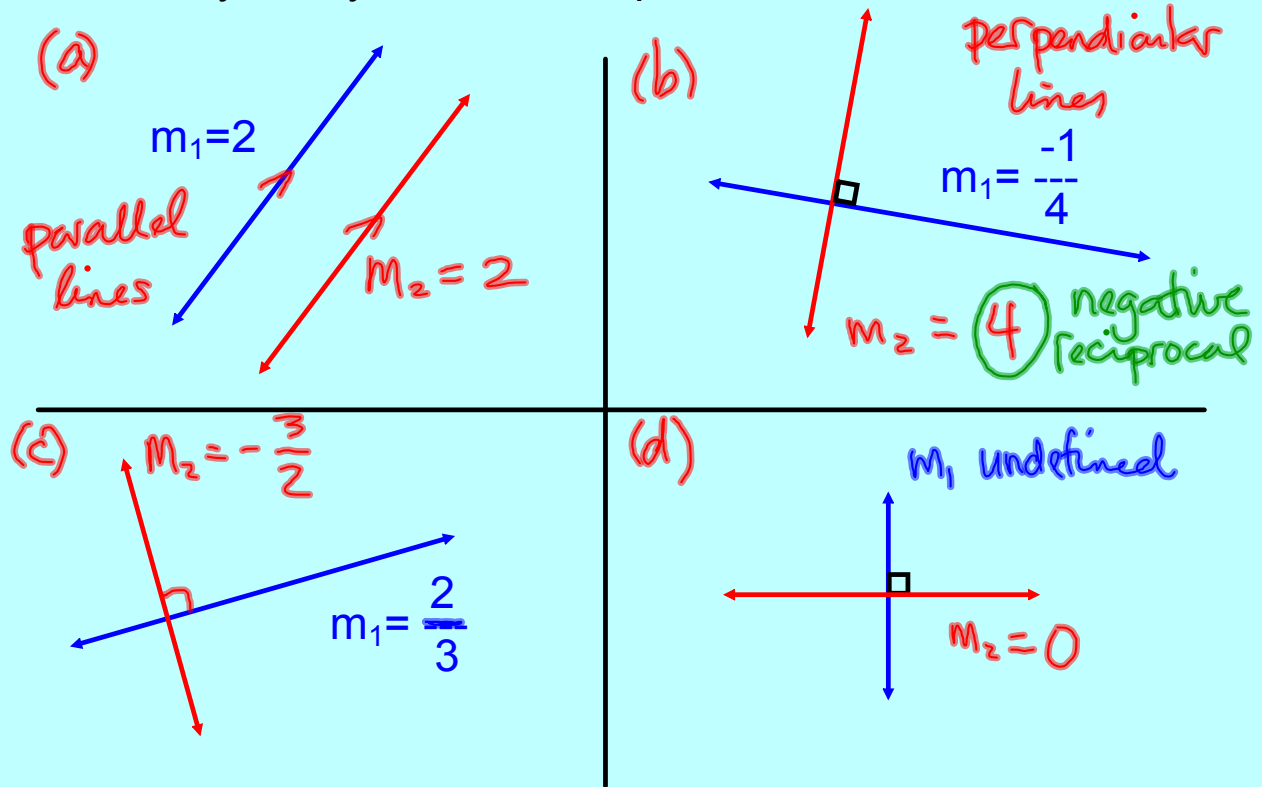
(a)  slope is positive

(b)  slope is negative

(c)  slope is zero

(d)  slope is undefined

What can you say about the slope of the red lines?



## Slope & the Equation of a Line

To write the equation of a line, we need

- a) slope ( $m$ )
- b) y-intercept ( $b$ )

$$y = m x + b$$

- a) to calculate  $m$  (slope), we need two points:  
 $(x_1, y_1)$  and  $(x_2, y_2)$

$$m =$$

- b) to calculate  $b$  (y-int), substitute any point on the line back into the equation and solve for  $b$ .

handout

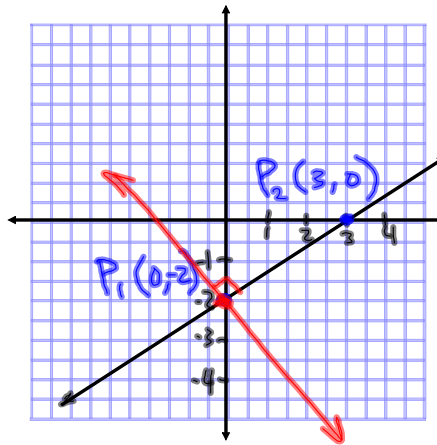
$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - (-2)}{3 - (0)}$$

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

$$y = mx + b$$

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



$$m_{\perp} = -\frac{3}{2}$$

"perpendicular"

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

## Slope & the Equation of a Line

Feb 24/2011

Ex.1 Determine the equation of the line:

(a) through (5, 1) and (7, -3).

$P_1$

$P_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - (1)}{7 - (5)} = \frac{-4}{2}$$

$$m = -2$$

$$y = mx + b$$

$$y = -2x + b$$

to find b, sub a point into equation

sub (5, 1)

$$1 = -2(5) + b$$

$$1 = -10 + b$$

$$11 = b$$

$$y = -2x + 11$$

(b) through (2, 6) and parallel to  $y = 2x + 3$

same slope

$$m = 2$$

$$y = 2x + b$$

Sub (2, 6)

$$6 = 2(2) + b$$

$$6 = 4 + b$$

$$\boxed{b = 2}$$

$$\boxed{\therefore y = 2x + 2}$$

(c) through (2, 6) and perpendicular to  $y = 2x + 3$

negative  
reciprocal  
of slope

$$m = 2$$

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

$$y = m_{\perp}x + b$$

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

Sub (2, 6)

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

$$6 = -1 + b$$

$$\boxed{b = 7}$$

$$\boxed{y = -\frac{1}{2}x + 7}$$

(d) through (5,2) with a slope of 0

$$m = 0$$

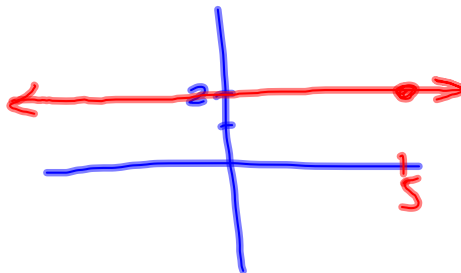
$$y = mx + b$$

$$y = (0)x + b$$

$$y = b$$

Sub (5,2)

$$2 = b$$



$$y = 2$$

horizontal lines  
always have the  
form  $y = b$

(e) through (5,2) with an undefined slope

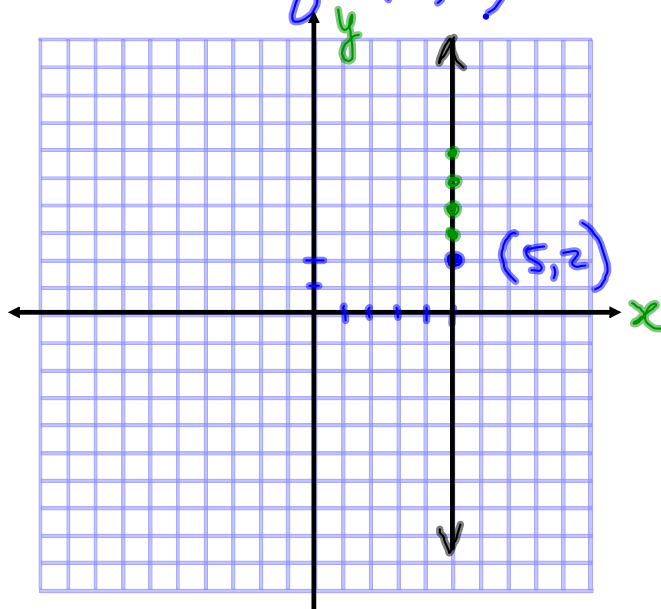
$$y = mx + b$$

Slope is  
undefined,  
cannot work  
with equation.

everywhere on this  
line,  $x = 5$

equation of  
a vertical line

vertical line  
through (5,2)



Assigned Work:

Ch 2: p.68-69 # 3, 4, 5abc, 6

p. 70 # 5(a)

$$\underline{3}(7-4x) - \frac{4}{3}(2x+1) = \underline{49} \quad [\times 3]$$

$$3z - \frac{4}{3}y = 49$$

$$9z - \cancel{3}\left(\frac{4}{\cancel{3}}y\right) = 147$$

$$9z - 4y = 147$$

$$9(7-4x) - 4(2x+1) = 147$$

$$63 - 36x - 8x - 4 = 147$$

$$-44x + 59 = 147$$

$$-44x = 88$$

$$\underline{-44} \quad \underline{-44}$$

$$x = -2$$

$$\frac{1}{4}(\underbrace{x+3}_a) + \frac{1}{3}(\underbrace{x-2}_b) = -\frac{1}{2}$$

$$\frac{1}{4}a + \frac{1}{3}b = -\frac{1}{2} \quad [\times 12]$$

$$\frac{12}{4}a + \frac{12}{3}b = -\frac{12}{2}$$

$$3a + 4b = -6$$

$$\rightarrow 3(x+3) + 4(x-2) = -6$$

$$3x + 9 + 4x - 8 = -6$$

$$7x + 1 = -6$$

$$7x = -7$$

$$x = -1$$

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

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

