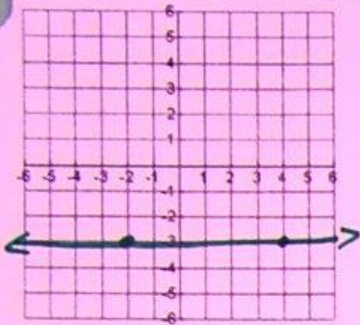


Slopes and Equations of Special Lines

1) a) Graph the line containing (4, -3) and (-2, -3).



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

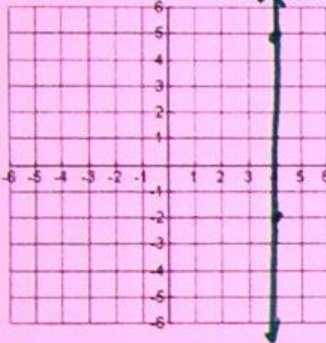
b) Find the slope using the slope formula. $m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$

c) What type of line did you graph? horizontal

d) Can you make a stair-step for your line? No

e) Write an equation for the line. y = -3

2) a) Graph the line containing (4, -2) and (4, 5).



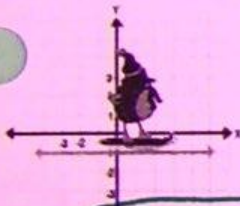
$$m = \frac{5 - (-2)}{4 - 4} = \frac{7}{0} \text{ undefined (no slope)}$$

b) Find the slope using the slope formula. $m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$

c) What type of line did you graph? vertical

d) Can you make a stair-step for your line? No

e) Write an equation for the line. x = 4



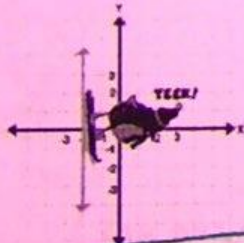
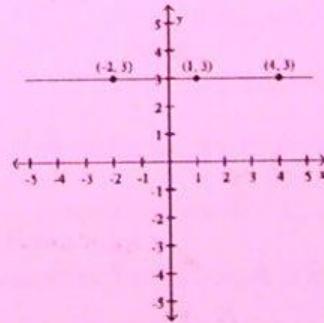
Horizontal Lines

The slope of any horizontal line will be zero.

The equation of a horizontal line will be $y = \text{the } y\text{-intercept}$

Slope = 0

Equation: y = 3



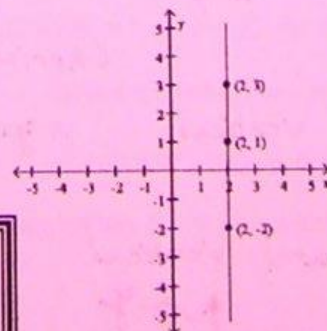
Vertical Lines

The slope of any vertical line will be undefined.

The equation of a vertical line will be $x = \text{the } x\text{-intercept}$

Slope = undefined

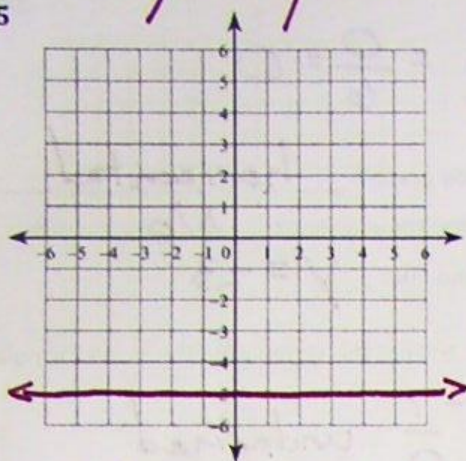
Equation: x = 2



Sketch the graph of each line. State the slope and two points on your line.

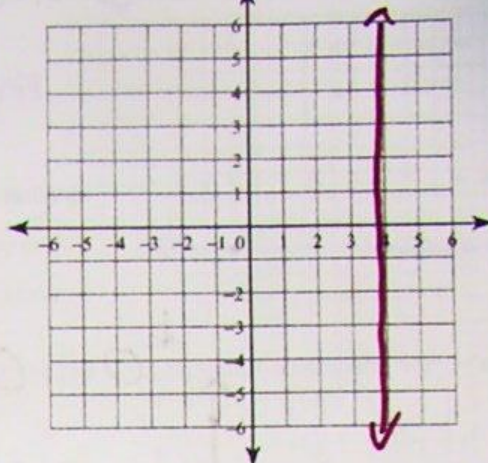
1) Slope: 0 Two points: $(-1, -5)$ $(4, -5)$

$y = -5$



2) Slope: $undefined$ Two points: $(4,)$ $(4,)$

$x = 4$



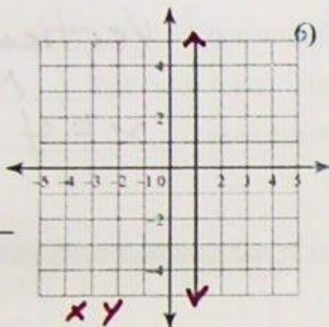
Write the equation of the line.

5)

Equation $x = 1$

Slope: $undefined$

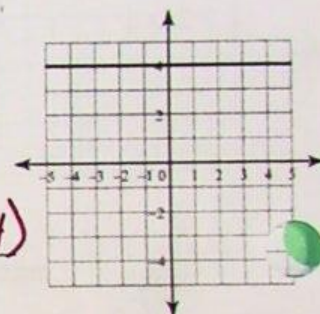
Two points: $(1,)$ $(1,)$



Equation $y = 4$

Slope: 0

Two points: $(, 4)$ $(, 4)$



7. horizontal line through the point $(2, 5)$.

8. vertical line containing $(-9, 3)$.

9. line has undefined slope and passes through $(14, 8)$

10. line contains $(5, -8)$ and has slope 0

11. line is parallel to the x-axis and contains $(9, 10)$

12. line goes through $(11, 12)$ and is parallel to the y-axis

13. line passes through $(5, -6)$ and is perpendicular to the y-axis

14. line has no slope and contains the origin

15. line is parallel to $x = 2$ and contains $(6, 0)$

16. line is perpendicular to $x = -3$ and contains $(-7, 0)$

$y = 5$

$x = -9$

$x = 14$

$y = -8$

$y = 10$

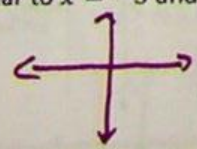
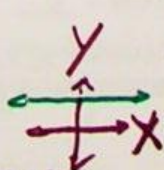
$x = 11$

~~$y = -6$~~ $y = -6$

$x = 0$

$x = 6$

$y = 0$



THINK!!

Integration: Geometry

Parallel and Perpendicular Lines

Write an equation in slope-intercept form of the line that passes through the given point and is parallel to the graph of each equation.

1. $2x + y = 5$; $(3, 1)$

$$y = mx + b$$

$$1 = -2 \cdot 3 + b$$

$$1 = -6 + b$$

$$b = 7$$

$$y = -2x + 5$$

$$\parallel m = -2$$

$$y = -2x + 7$$

2. $3x - y = 5$; $(-1, -2)$

$$y = mx + b$$

$$-2 = 3 \cdot (-1) + b$$

$$-2 = -3 + b$$

$$b = 1$$

$$-y = -3x + 5$$

$$y = 3x - 5$$

$$\parallel m = 3$$

$$y = 3x + 1$$

3. $5x - 4y = 1$; $(-8, 2)$

$$y = mx + b$$

$$2 = \frac{5}{4} \cdot (-8) + b$$

$$2 = -10 + b$$

$$b = 12$$

$$-4y = -5x + 1$$

$$y = \frac{5}{4}x - \frac{1}{4}$$

$$\parallel m = \frac{5}{4}$$

$$y = \frac{5}{4}x + 12$$

4. $9x + 3y = 8$; $(-1, -4)$

$$y = mx + b$$

$$-4 = -3(-1) + b$$

$$-4 = 3 + b$$

$$b = -7$$

$$3y = -9x + 8$$

$$y = -3x + \frac{8}{3}$$

$$\parallel m = -3$$

$$y = -3x - 7$$

5. $y = \frac{4}{3}x + 5$; $(12, 3)$

$$y = mx + b$$

$$3 = \frac{4}{3} \cdot 12 + b$$

$$3 = 16 + b$$

$$b = -13$$

$$\parallel m = \frac{4}{3}$$

$$y = \frac{4}{3}x - 13$$

6. $y = -\frac{3}{4}x + \frac{1}{4}$; $(4, -2)$

$$y = mx + b$$

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

$$-2 = -3 + b$$

$$b = 1$$

$$\parallel m = -\frac{3}{4}$$

$$y = -\frac{3}{4}x + 1$$

Write an equation in slope-intercept form of the line that passes through the given point and is perpendicular to the graph of each equation.

7. $x - 6y = 2$; $(2, 4)$

$$y = mx + b$$

$$4 = -6 \cdot 2 + b$$

$$4 = -12 + b$$

$$b = 16$$

$$-6y = -x + 2$$

$$y = \frac{1}{6}x + \frac{1}{3}$$

$$\perp m = -6$$

$$y = -6x + 16$$

8. $3x + 2y = -7$; $(1, 1)$

$$y = mx + b$$

$$1 = \frac{3}{2} \cdot 1 + b$$

$$1 = \frac{3}{2} + b$$

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

$$2y = -3x - 7$$

$$y = -\frac{3}{2}x - \frac{7}{2}$$

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

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

9. $5x + 4y = 8$; $(10, 5)$

$$y = mx + b$$

$$5 = \frac{5}{4} \cdot 10 + b$$

$$5 = 12.5 + b$$

$$b = -7.5$$

$$4y = -5x + 8$$

$$y = -\frac{5}{4}x + 2$$

$$\perp m = \frac{4}{5}$$

$$y = \frac{4}{5}x - 3$$

10. $4x + 3y = -6$; $(2, 1)$

$$y = mx + b$$

$$1 = \frac{4}{3} \cdot 2 + b$$

$$1 = 2\frac{2}{3} + b$$

$$b = -\frac{1}{3}$$

$$3y = -4x - 6$$

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

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

$$y = \frac{3}{4}x - \frac{1}{2}$$

11. $y = \frac{1}{4}x - 4$; $(-2, 3)$

$$y = mx + b$$

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

$$3 = \frac{1}{2} + b$$

$$b = -\frac{5}{2}$$

$$\perp m = -4$$

$$y = -4x - 5$$

12. $2x + 10y = 3$; $(2, 3)$

$$y = mx + b$$

$$3 = 5 \cdot 2 + b$$

$$3 = 10 + b$$

$$b = -7$$

$$10y = -2x + 3$$

$$y = -\frac{1}{5}x + \frac{3}{10}$$

$$\perp m = 5$$

$$y = 5x - 7$$

13. $x = 2y - 1$; $(0, 0)$

$$y = mx + b$$

$$0 = 0 + b$$

$$b = 0$$

$$-2y = -x - 1$$

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

$$\perp m = -2$$

$$y = -2x$$

14. $4x + 7y = 6$; $(-4, 1)$

$$y = mx + b$$

$$1 = \frac{4}{7} \cdot (-4) + b$$

$$1 = -\frac{16}{7} + b$$

$$b = \frac{7}{7} = 1$$

$$7y = -4x + 6$$

$$y = -\frac{4}{7}x + \frac{6}{7}$$

$$\perp m = \frac{7}{4}$$

$$y = \frac{7}{4}x + 8$$