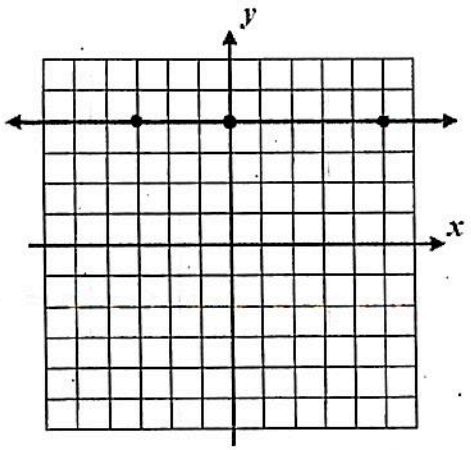
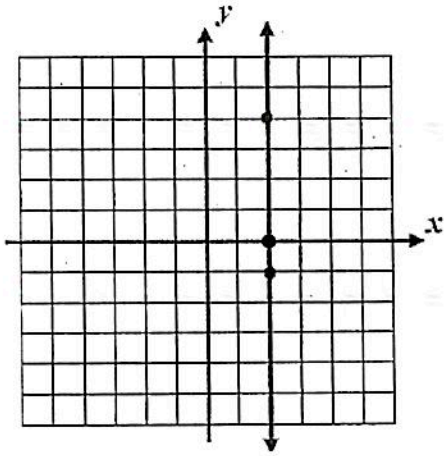
Algebra RH

Essential Question: How do we graph horizontal and vertical lines?

Do Now: Pictured below is the graph of a **horizontal line** and a **vertical line.**





HORIZONTAL LINE

a) Name three points on the line.

(-3, 4) (0, 4) (5, 4)

b) What do these three points have in common? y value is 4

VERTICAL LINE

a) Name three points on the line.

(2, 4) (2, 0) (2, -1)

b) What do these three points have in common? x value is 2

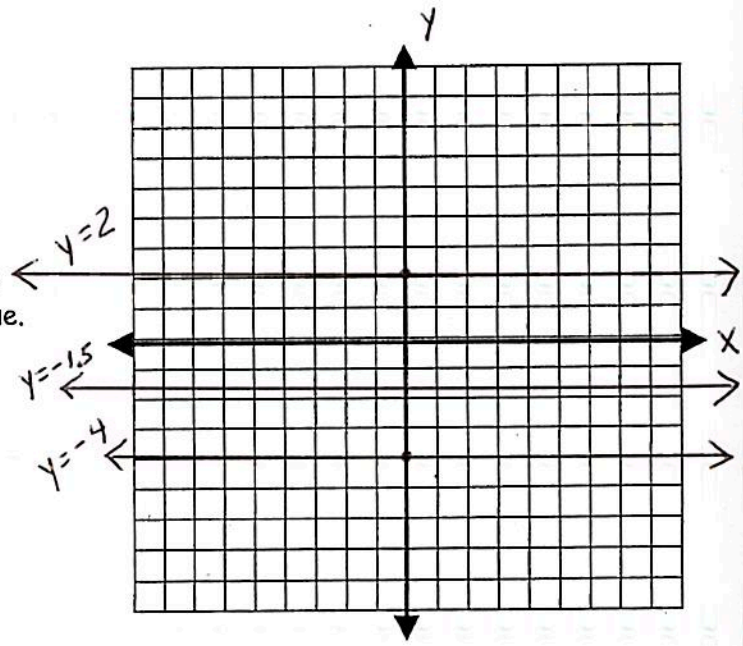
Equation for a Horizontal Line

The equation of a horizontal line is $y = b$, where b is any real number.

Example: $y = 2$

The y-value for the points that make up this equation is always 2 regardless of the x-value.

On the same coordinate plane:
(A) Graph $y = 2$
(B) Graph $y = -4$
(C) Graph $y = -1.5$



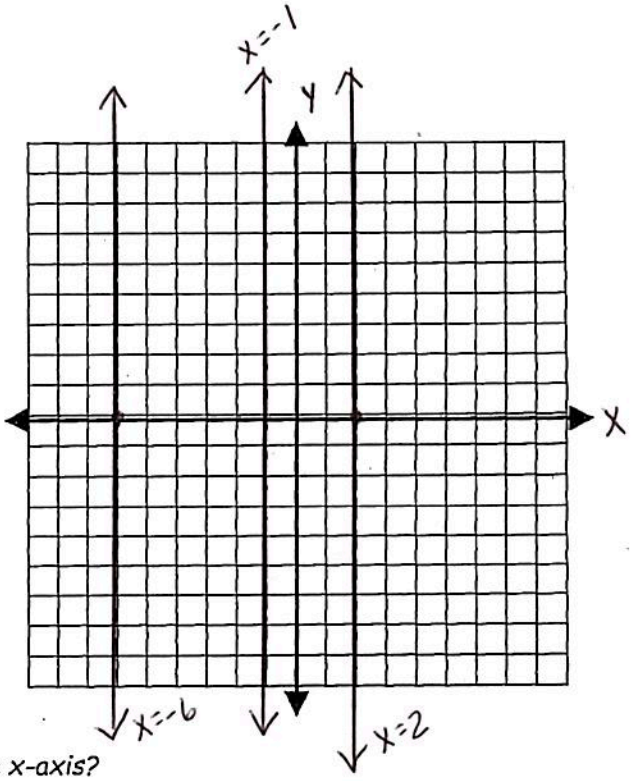
Equation for a Vertical Line

The equation of a vertical line is $x = a$, where a is any real number.

Example: $x = 2$

The x-value for the points that make up this equation is always 2 regardless of the y-value.

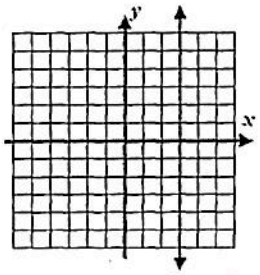
On the same coordinate plane:
(A) Graph $x = 2$
(B) Graph $x = -6$
(C) Graph $x = -1$



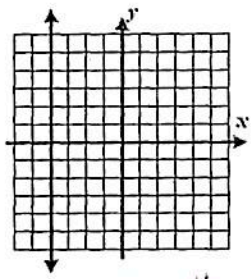
What is the equation of the line that represents the x-axis?
horizontal line that cuts the y-axis at 0 → $y = 0$

What is the equation of the line that represents the y-axis?
vertical line that cuts the x-axis at 0 → $x = 0$

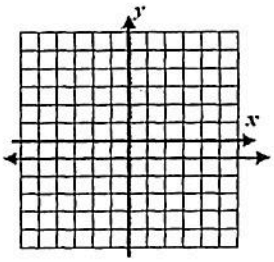
For each of the following, give the equation of the line shown or described.

(a)


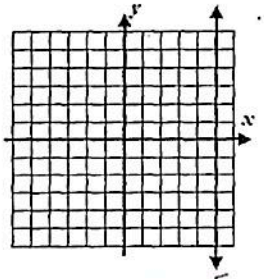
EQUATION: $x = 3$

(b)


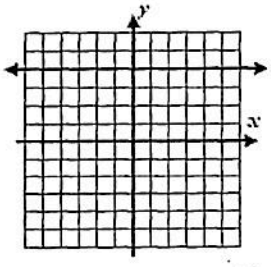
EQUATION: $x = -4$

(c)


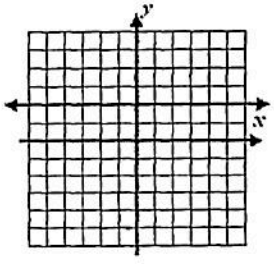
EQUATION: $y = -1$

(d)


EQUATION: $x = 5$

(e)


EQUATION: $y = 4$

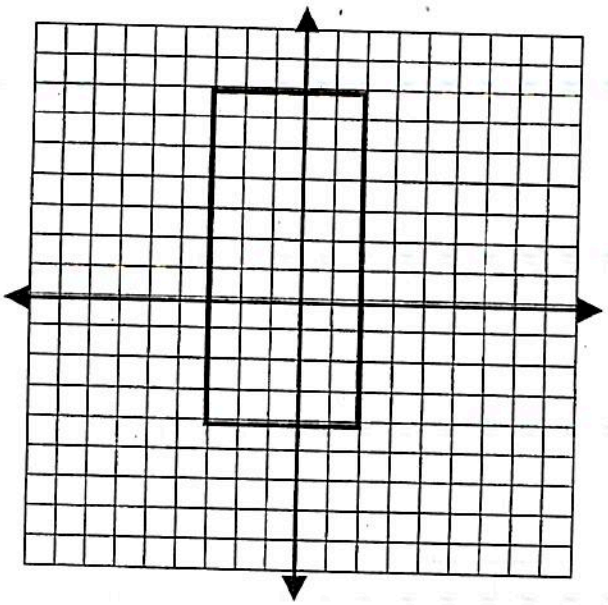
(f)


EQUATION: $y = 2$

(g) The equation of a vertical line passing through the point $(-4, 5)$.
intersects x-axis
$x = -4$

(h) The equation of a horizontal line passing through the point $(3, 2)$.
intersects y-axis
$y = 2$

Geometric Figures on the Coordinate Plane



1) a) Name this figure and explain your reasoning.

rectangle
both pairs of opposite sides are = and all right angles

b) Find its perimeter.

$2(5) + 2(11) \rightarrow 32$ units

c) Find its area.

$5(11) \rightarrow 55$ units^2

d) What are the equations of its boundary lines?

horizontal $y = -4$ $\quad -3 \leq x \leq 2$

$y = 7$ $\quad -3 \leq x \leq 2$

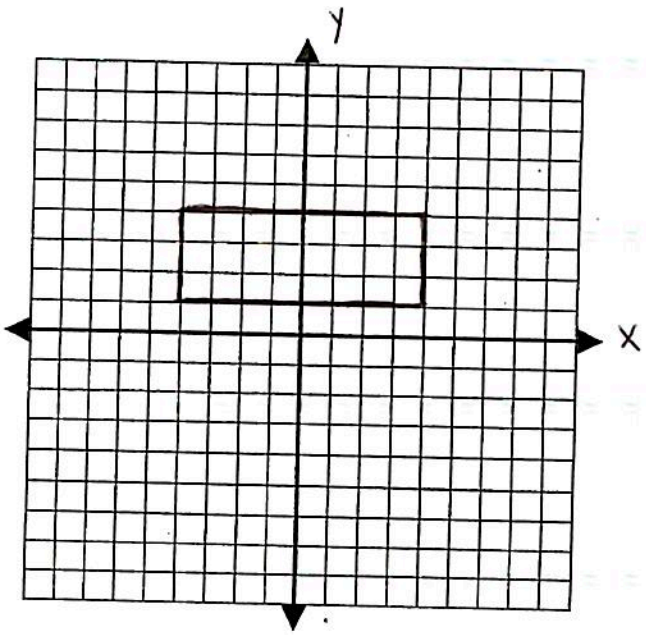
vertical $x = 2$ $\quad -4 \leq y \leq 7$

$x = -3$ $\quad -4 \leq y \leq 7$

2) Using vertical and horizontal lines, determine the boundary lines of a rectangular figure on the coordinate plane whose area is 24 un^2.

Answers will vary

integral sides could be 1, 24
2, 12
3, 8
4, 6



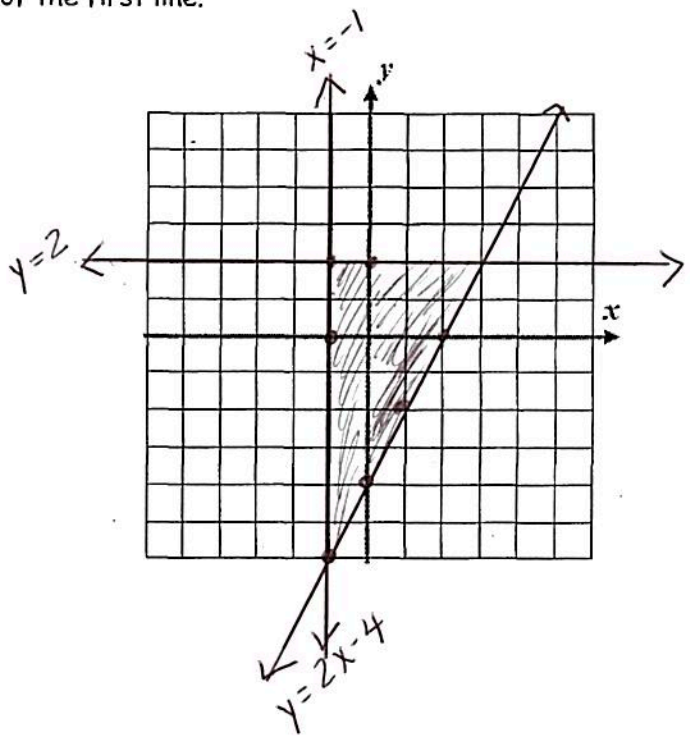
example: $y = 1$
$y = 4$
$x = -4$
$x = 4$

3) Sketch the region bounded by the three lines whose equations are given below. Label each with its equation. Find the area of the triangular region enclosed by the lines. You may want to use your calculator to create a table of values of the first line.

$y = 2x - 4$

$x = -1$

$y = 2$



$y = 2x - 4$

x	y
-2	-8
-1	-6
0	-4
1	-2
2	0

Area of a triangle

$A = \frac{1}{2}bh$

$= \frac{1}{2}(4)(8)$

$= 16 \text{ units}^2$