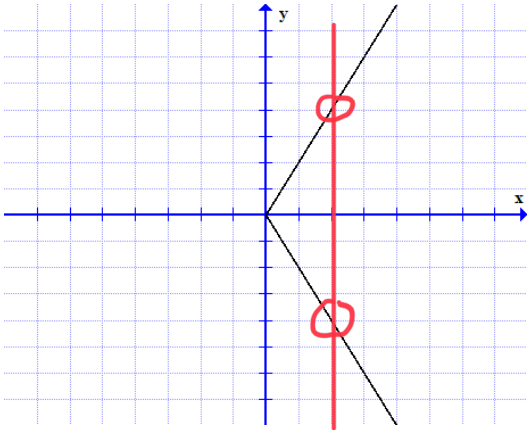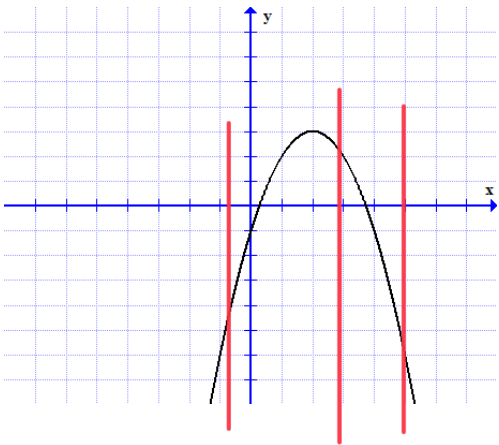Section 3.2: Domain and Range of graphs of functions
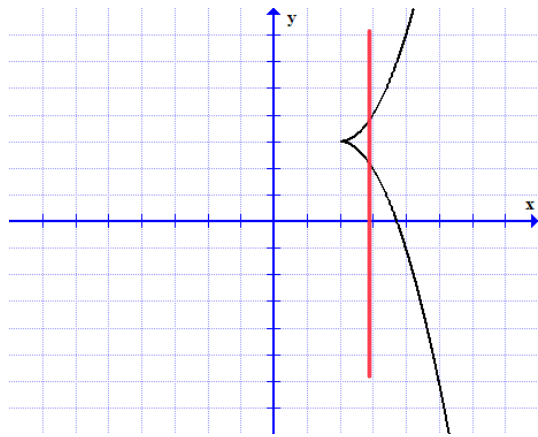
#1-10: Use the vertical line test to determine if the graph represents y as a function of x.

1)

fails vertical
line test (V.L.T.)

y IS NOT a
function of x

I

3)

Passes V.L.T.

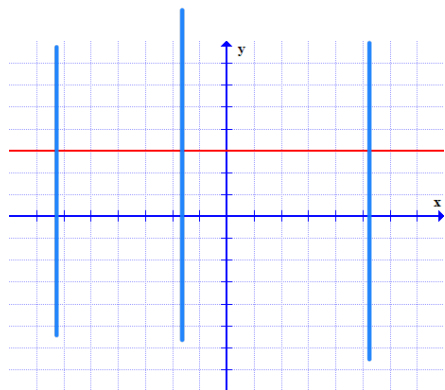y IS a function of X

5)

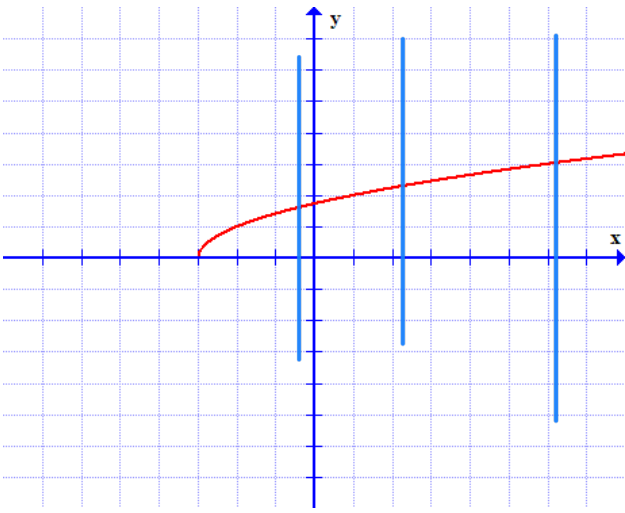fails V.L.T

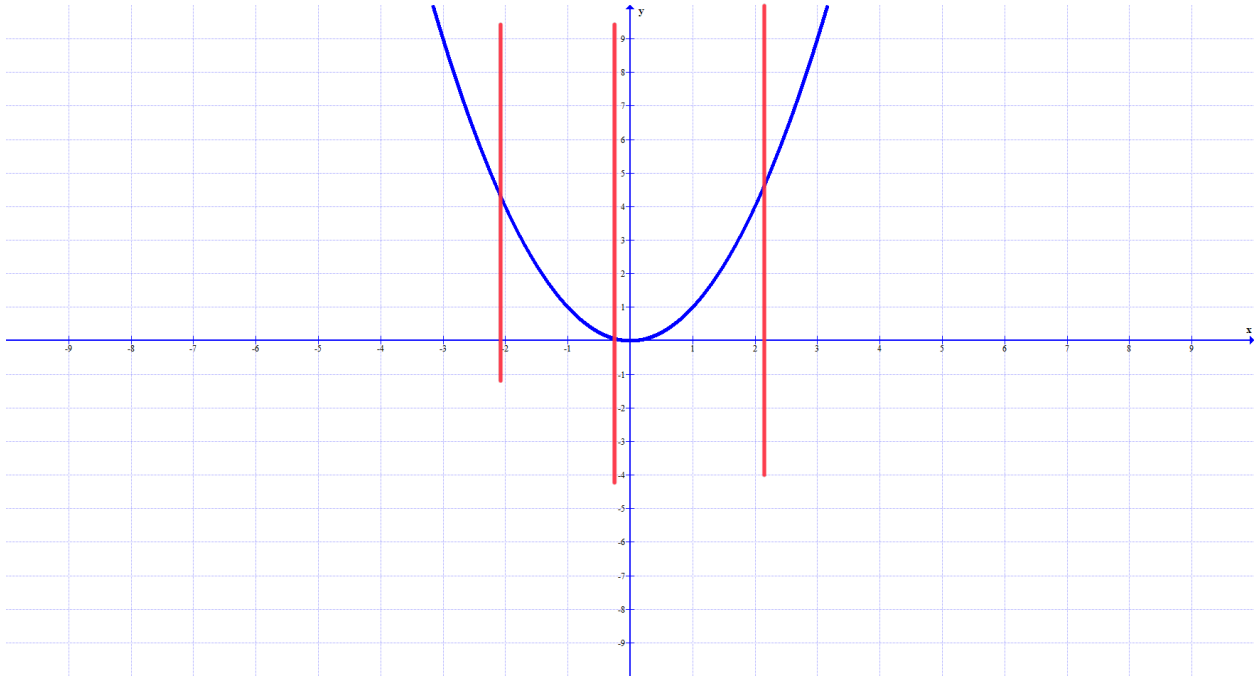y IS <u>not</u> a function of X
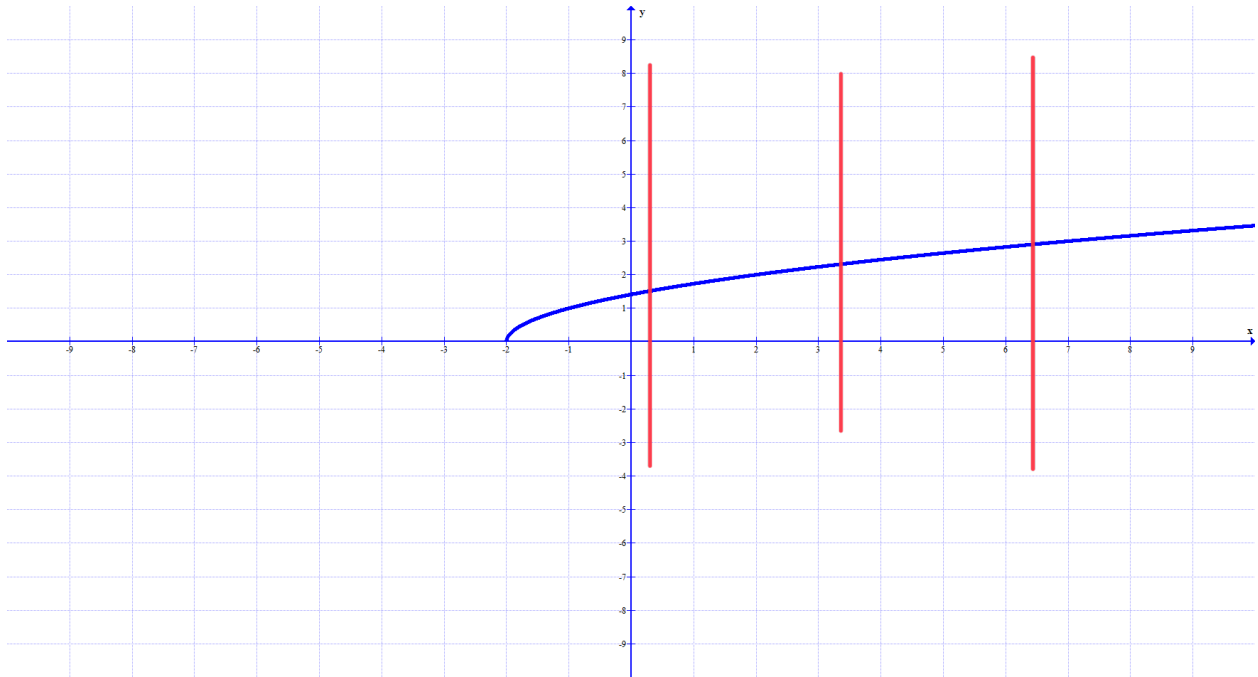
7)

Passes V.L.T.

y <u>IS</u> a function of X

9)

#11 – 2: Determine whether the equation defines y as a function of x. Hint, solve the equation for y and sketch a graph using your calculator, then apply the vertical line test.

11) $y = x^2$

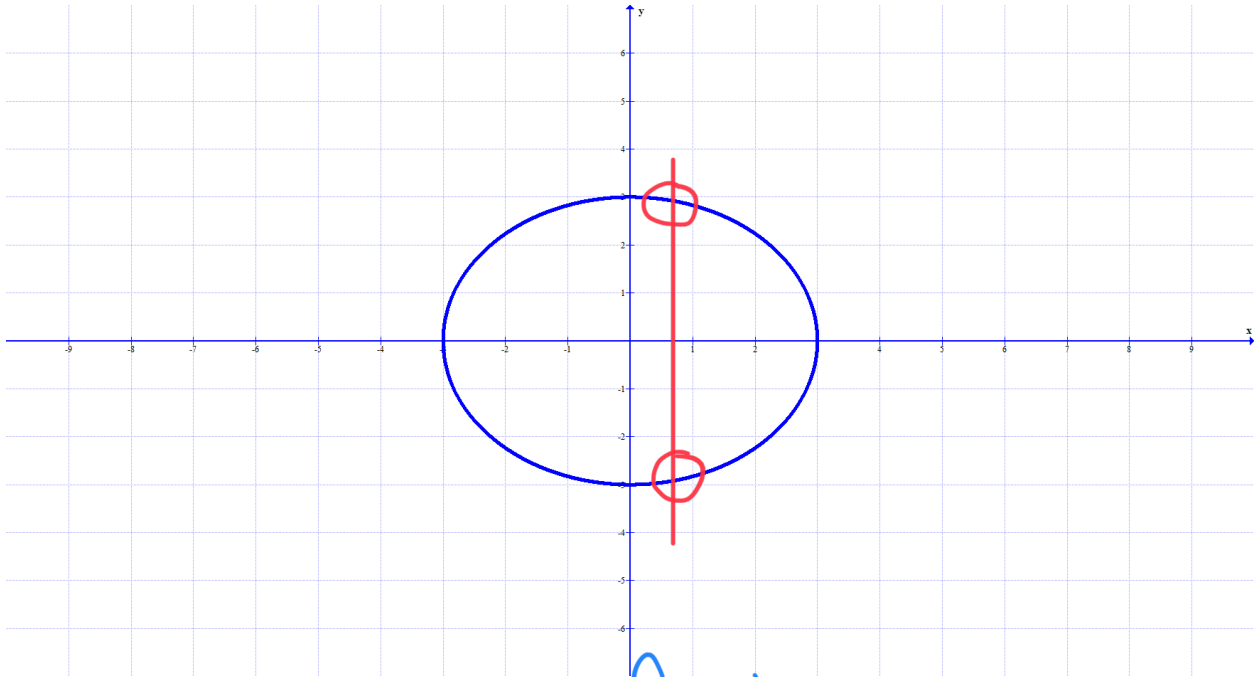
Passes V.L.T.
 y IS a function of x

13) $y = \sqrt{x + 2}$

Passes V.L.T.

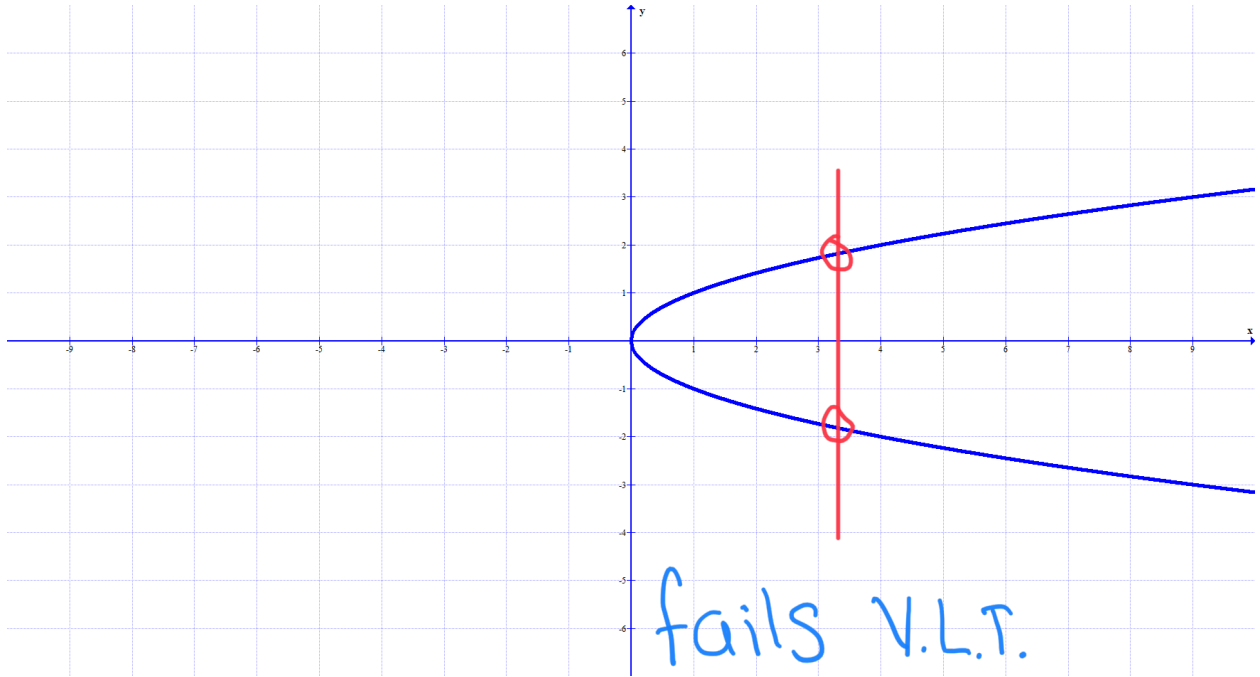$y \underline{\underline{IS}}$ a function of x

15) $y^2 + x^2 = 9$
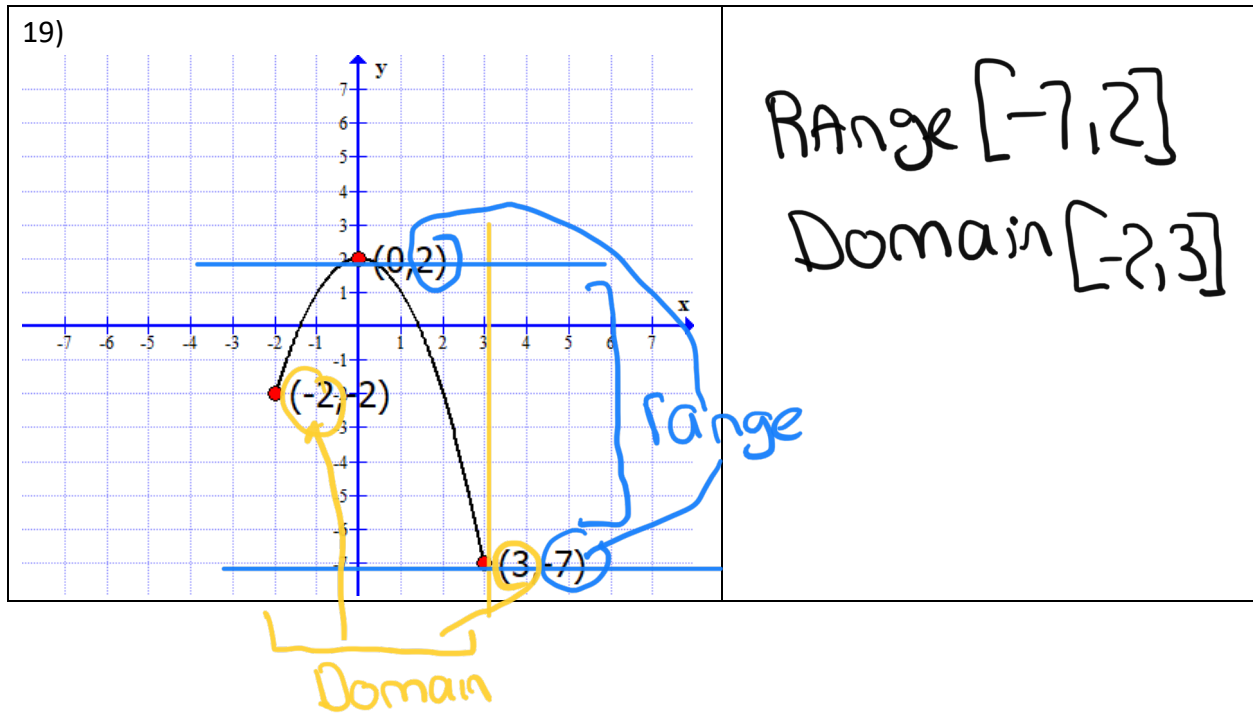

fails V.L.T.

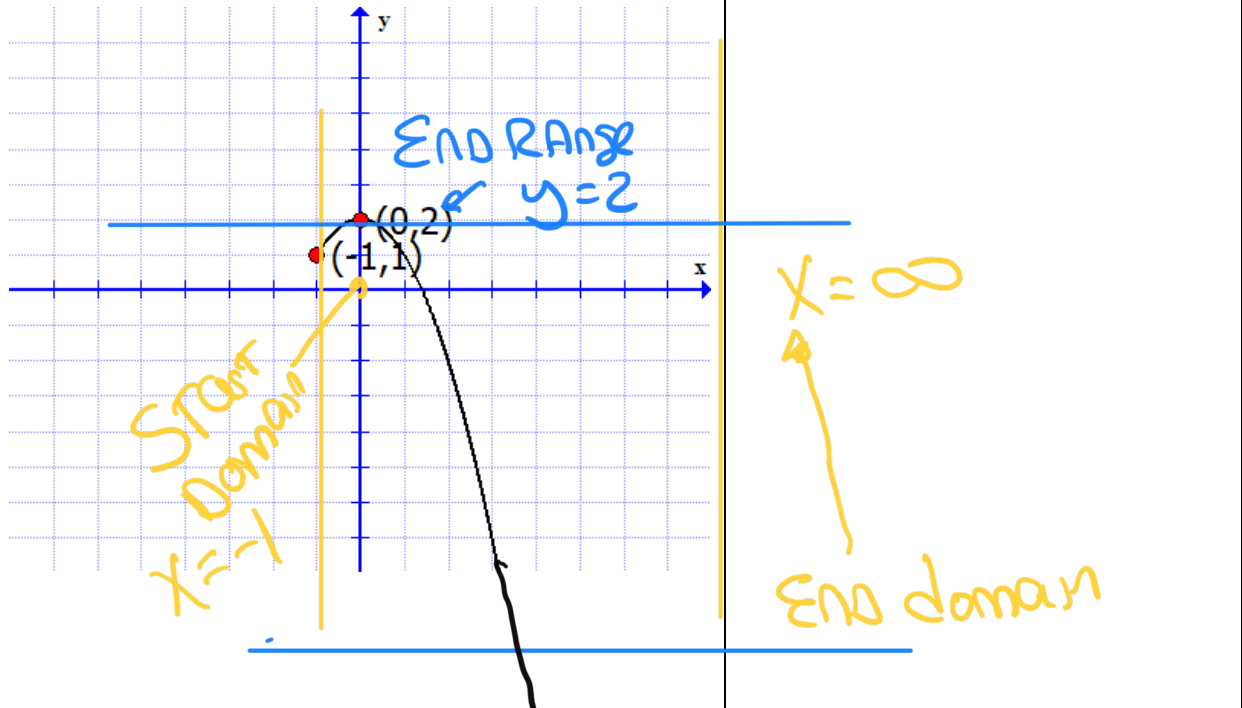y In NOT a function OF X

17) $x = y^2$

fails V.L.T.

y IS _NOT_ a
function OF X

#19 – 38: Find the domain and range of function. Write your answer in interval notation.

19)

Range $[-7, 2]$

Domain $[-2, 3]$

range

Domain

21)

END RANGE
y = 2

(0,2)
(-1,1)

x

y

START
Domain
x = -1

x = ∞

End domain

Domain

$[-1, ∞)$

← START Range
y = -∞

Range $(-∞, 2]$
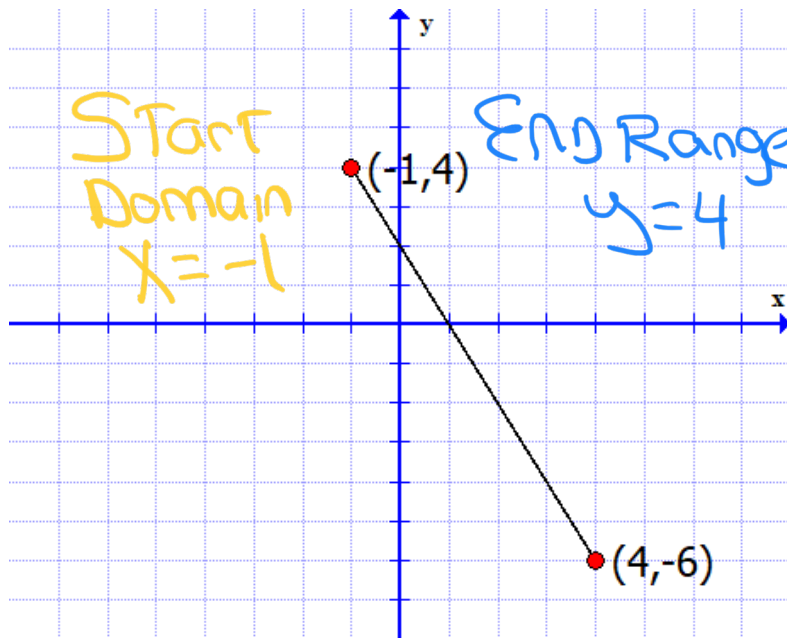
23)

End range
y = 2

(0,2)
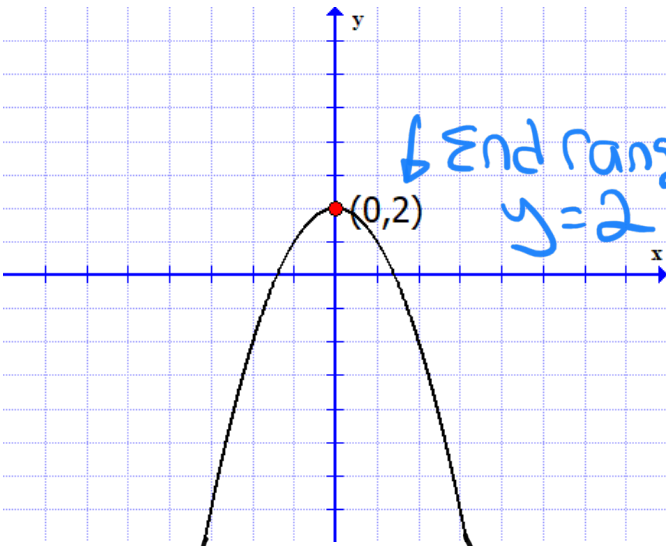
Domain $(-\infty, \infty)$
Range $(-\infty, 2]$

START Domain $x = -\infty$

End Domain $x = \infty$

START RANGE
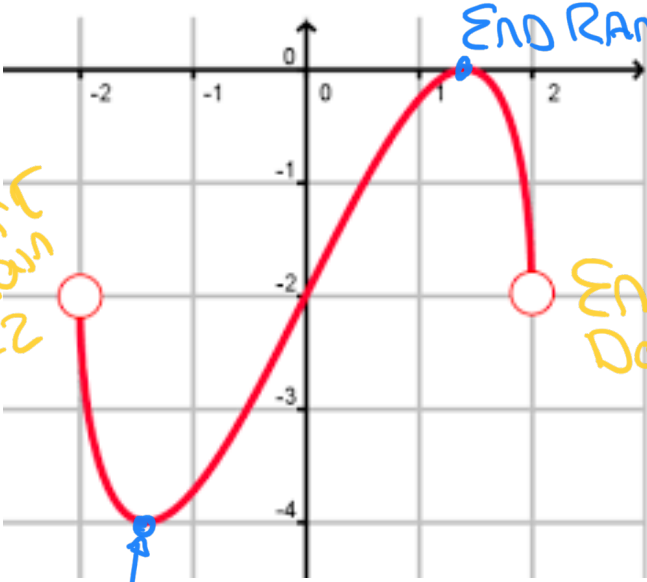$y = -\infty$

25)

Start
Domain
X = -1

End Range
y = 4

(-1,4)

(4,-6)

End domain
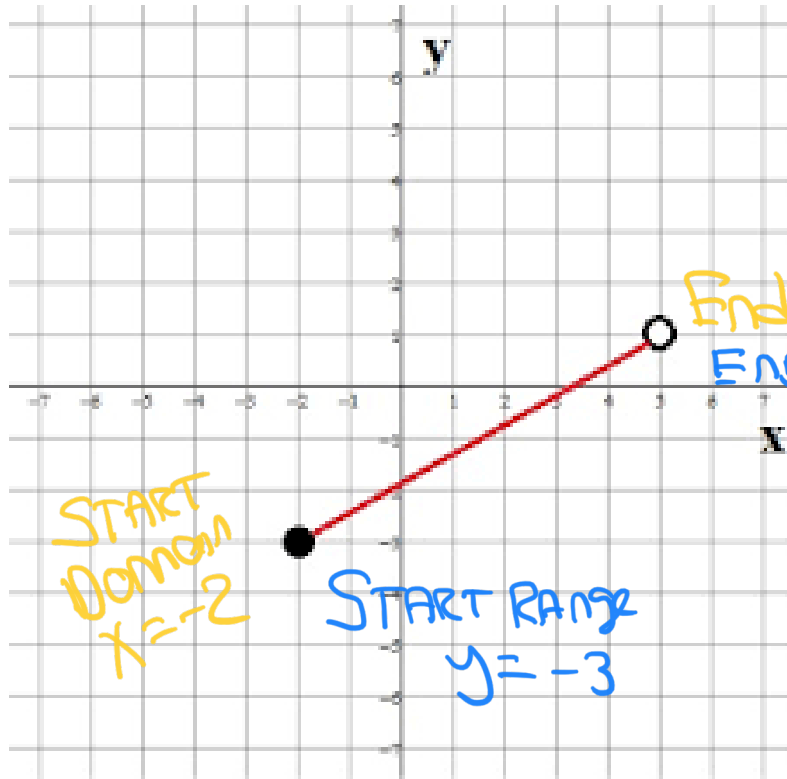X = 4

START
Range y = -6

27)

End Range y = 0

START Domain X = -2

End Domain X = 2

Start range y = -4
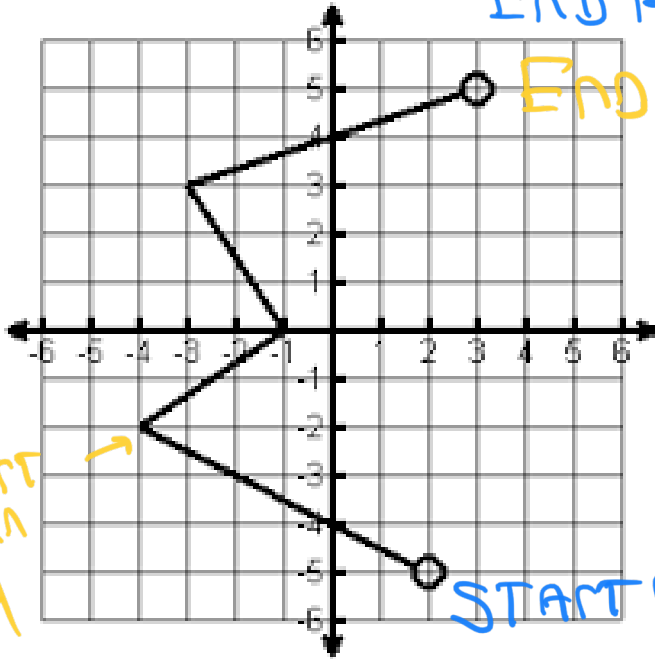
Domain (-2, 2]
Range [-4, 0]

29)

End Domain X=5
END RANGE y=1
START Domain X=-2
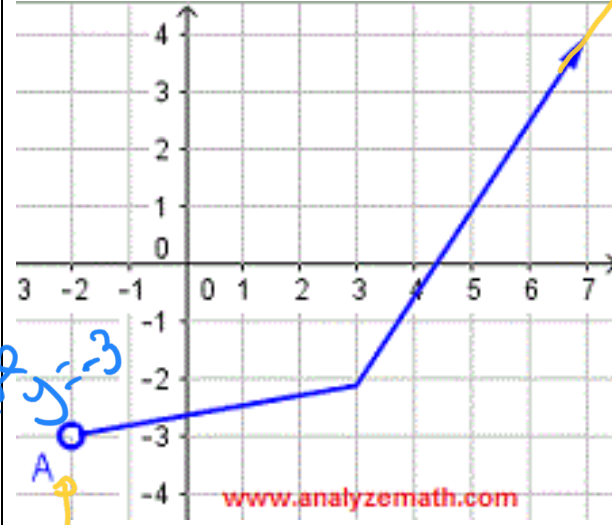START RANGE y=-3

Domain [-2, 5)
Range [-3, 1)

31)

End Range y=5
End Domain X=3
Start domain X=-4
START RANGE y= -5

Domain [-4,3)
Range (-5, 5)

33)

Domain End X=∞

Range End y=∞

Range Start y=-3

Domain Start X=-2

Domain (-2, ∞)

Range (-3, ∞)

35)

End range y = 4

Eng Domain X = 4

START Domain X = -5

START Range y = -2
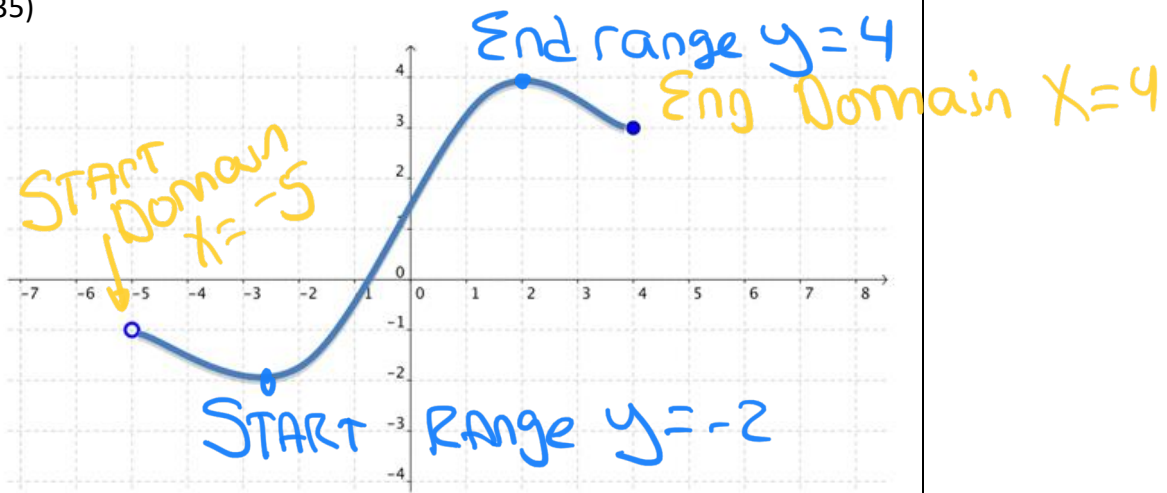
Domain (-5, 4]

Range [-2, 4]

37)

Domain End $x = \infty$
Range End $y = \infty$
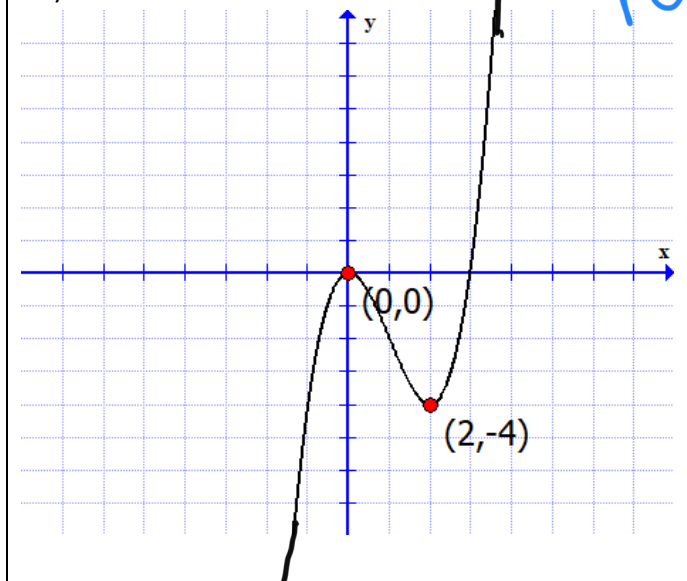
(0,0)

(2,-4)

Domain $(-\infty, \infty)$
Range $(-\infty, \infty)$

Domain Start $x = -\infty$
Range Start $y = -\infty$

#39 – 53 Use algebra to find the domain of each function. Write your answer in interval notation.

39) $f(x) = \sqrt{x - 2}$

$$x - 2 \geq 0$$
$$\underline{+2 \qquad +2}$$
$$x \geq 2$$

Domain $[2, \infty)$

41) $g(x) = \sqrt{3x + 12}$

$$3x + 12 \geq 0$$
$$\underline{-12 \quad -12}$$
$$\frac{3x}{3} \geq \frac{-12}{3}$$
$$x \geq -4$$

Domain $[-4, \infty)$

43) $f(x) = \frac{x+2}{x-3}$

$X - 3 = 0$

$X = 3$

$-\infty \qquad 3 \qquad \infty$
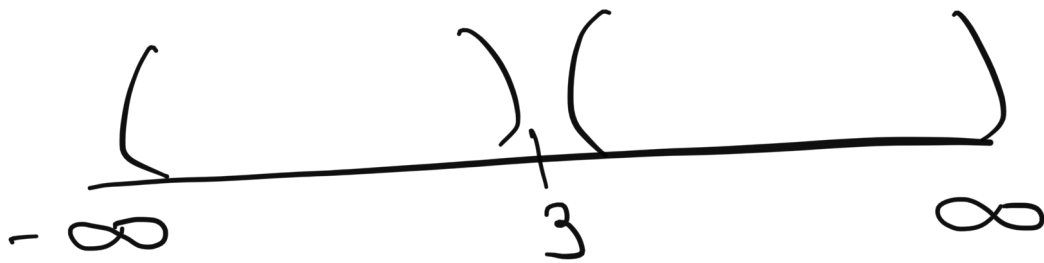
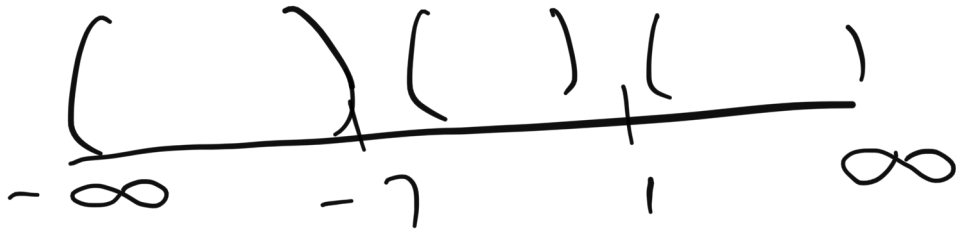domain $(-\infty, 3) \cup (3, \infty)$

45) $f(x) = \dfrac{2}{x^2+6x-7}$

$$x^2 + 6x - 7 = 0$$
$$(x+7)(x-1) = 0$$
$$x+7 = 0 \qquad x-1 = 0$$
$$x = -7 \qquad x = 1$$

Domain $(-\infty, -7) \cup (-7, 1) \cup (1, \infty)$

47) g(x) = 2x - 10

No Algebra for domain

Domain $(-\infty, \infty)$

49) $g(x) = x^2 + 5$

NO Algebra for domain

$(-\infty, \infty)$

51) $f(x) = x^2 + 2x - 15$

No Algebra for domain

$(-\infty, \infty)$