

① Algebra:  $X =$

② Graph:  $X$ -int. ( $X =$  )  $\rightarrow Y = 0$

Example 2: **Solve** for  $f(x) = X^2 - 8X + 12$

$a = 1$   $b = -8$   $c = 12$

1) Find the Vertex

$$X = \frac{-b}{2a}$$

$$X = \frac{-(-8)}{2(1)}$$

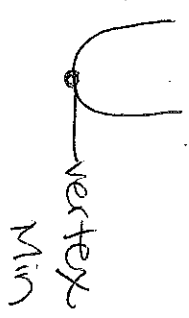
$$X = 4$$

$X$	$X^2 - 8X + 12$	$f(x)$	$(X, Y)$
1	$1^2 - 8(1) + 12$	5	(1, 5)
2	$2^2 - 8(2) + 12$	0	(2, 0)
3	$3^2 - 8(3) + 12$	-3	(3, -3)
4	$4^2 - 8(4) + 12$	-4	(4, -4)
5	$5^2 - 8(5) + 12$	-3	(5, -3)
6	$6^2 - 8(6) + 12$	0	(6, 0)
7	$7^2 - 8(7) + 12$	5	(7, 5)

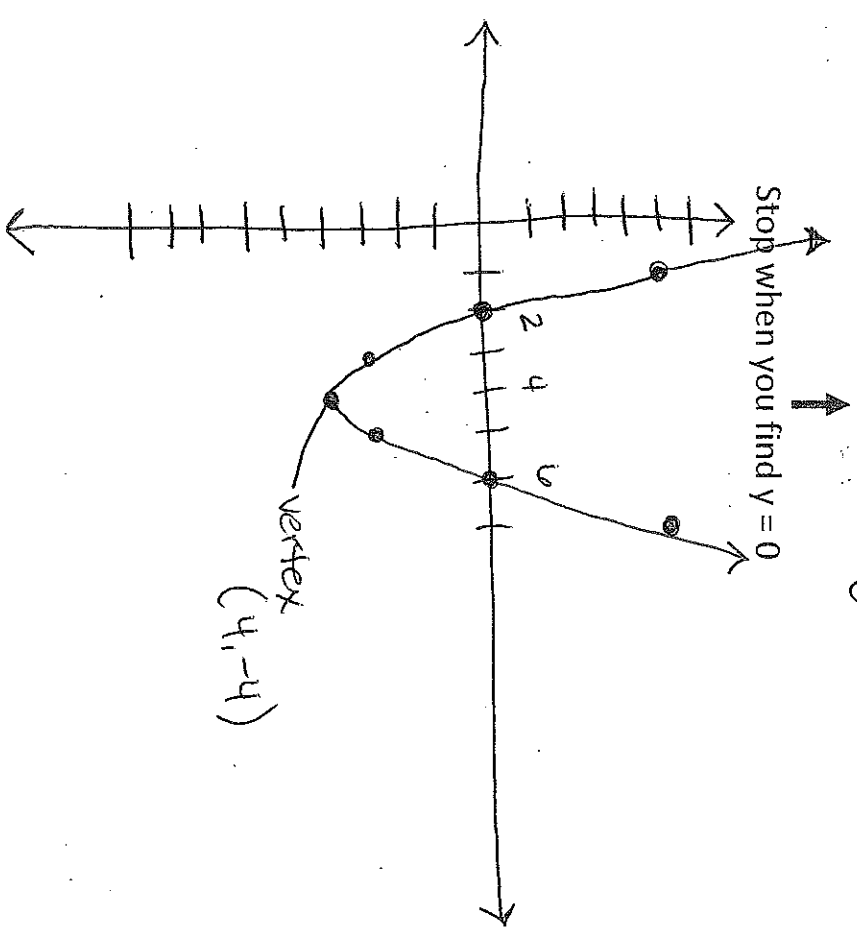
2) Let's check our work: How many solutions does the function have?

- Graph the vertex
- Is this a SMILEY or SAD face?
- How many times does it touch the x-axis?  $2$

$$a = 1$$



ANSWER:  $X$ -int. @  $X = 2, 6$



Example 3: Solve for  $f(x)$ :  $x^2 + 2x - 15 = 0$

1) Find the Vertex

$$x = \frac{-b}{2a}$$

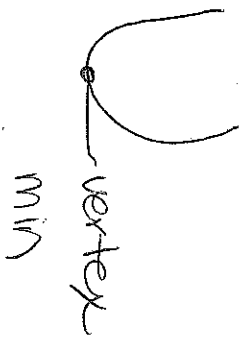
$$x = \frac{-(-2)}{2(1)} = -1$$

x	$x^2 + 2x - 15$	$f(x)$	$(x, f)$
-5			$(-5, 0)$
-4			
-3			
-2			
-1		-16	$(-1, -16)$
0		-15	$(0, -15)$
1	$1^2 + 2(1) = 15$	-7	
2	$2^2 + 2(2) = 15$		
3	$3^2 + 2(3) = 15$		$(3, 0)$

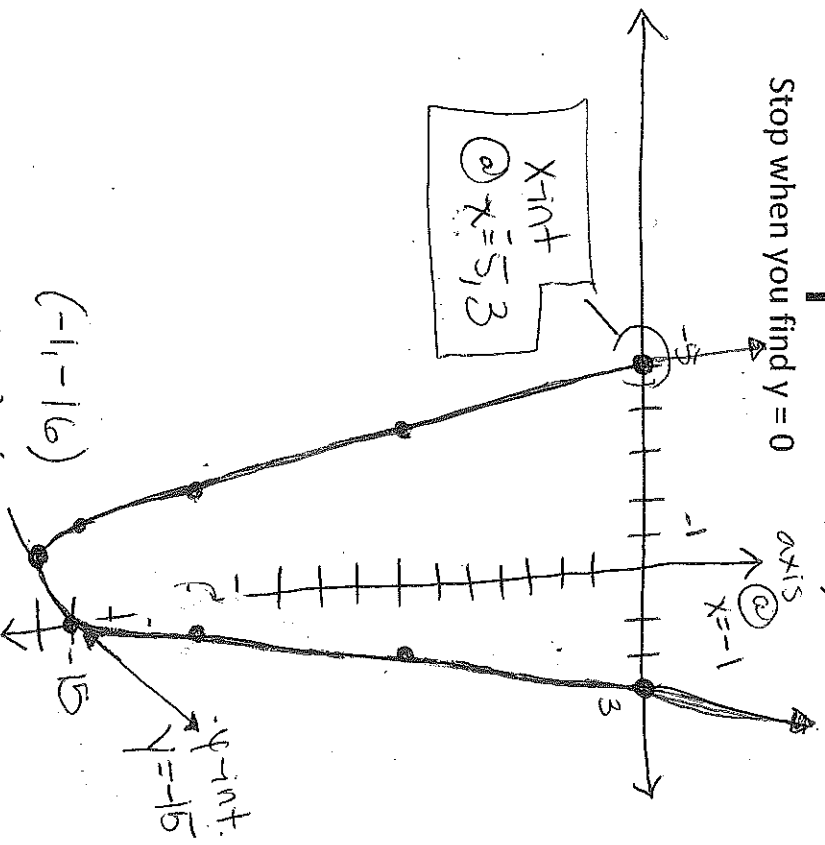
2) Let's check our work: How many solutions does the function have?

- Graph the vertex
- Is this a SMILEY or SAD face?
- How many times does it touch the x-axis?

$$a = +1 \rightarrow$$



Answer: x-int. @  $x = -5, 3$



LT 3.2 & 3.3 Quick Check #2

LT 3.2-3.3H

Good luck!

LT 3.2 Graphing using the equation of the axis of symmetry

Score: 4

1) Graph the quadratic function  $f(x) = 100 - 2x - x^2$  by using the equation of the axis of symmetry.

a) Show your work here.

$$f(x) = -x^2 - 2x + 100$$

①  $x = \frac{-b}{2a} = \frac{-(-2)}{2(-1)} = \frac{2}{-2} = -1$       ① y-int @  $y = 100$

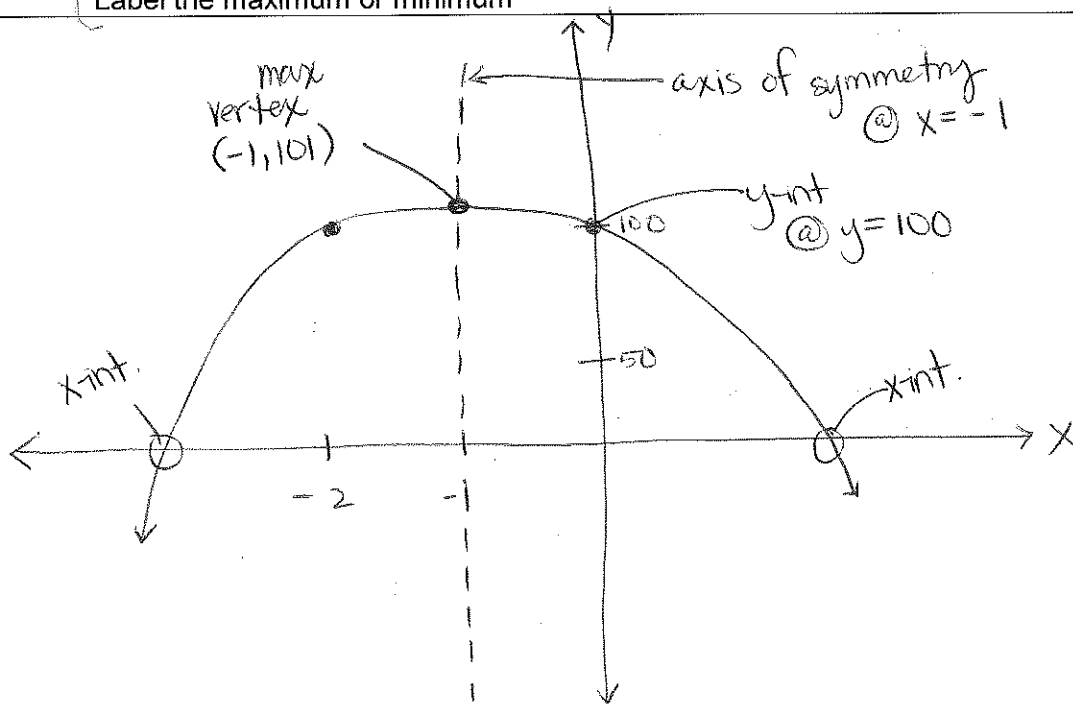
①  $f(-1) = 100 - 2(-1) - (-1)^2$   
 $= 100 + 2 - 1$   
 $= 102 - 1 = 101$   
 vertex @  $(-1, 101)$

b) Graph the quadratic function. ①

d) Where does each vocabulary occur?

- ⑤
- Label the vertex
  - Label the y-intercept
  - Label the x-intercept
  - Label the axis of symmetry
  - Label the maximum or minimum

Example:  $y =$  ,  $x =$  , etc. ⑤



Good luck!

LT 3.2 Graphing: Max and Min

Score: 2

- 2) Determine whether the function has a maximum or a minimum, AND find that value.

$$f(x) = -x^2 + 6x - 1$$

- a) Show your work here.

$$a = -1 \quad b = 6 \quad c = -1$$

↓

negative so

max

$$x = \frac{-b}{2a} = \frac{-6}{2(-1)} = 3$$

$$f(3) = -(3)^2 + 6(3) - 1$$

$$= -9 + 18 - 1$$

$$= 9 - 1 = 8$$

vertex @ (3, 8)

$$\boxed{\text{Max @ } y = 8}$$

LT 3.2 & 3.3 Quick Check #2

LT 3.2-3.3

Good luck!

LT 3.2 Graphing using the equation of the axis of symmetry

Score: 4

1) Graph the quadratic function  $f(x) = x^2 - 10x + 5$  by using the equation of the axis of symmetry.

$a=1 \quad b=-10 \quad c=5$

a) Show your work here.

① 
$$x = \frac{-b}{2a} = \frac{-(-10)}{2(1)} = 5$$

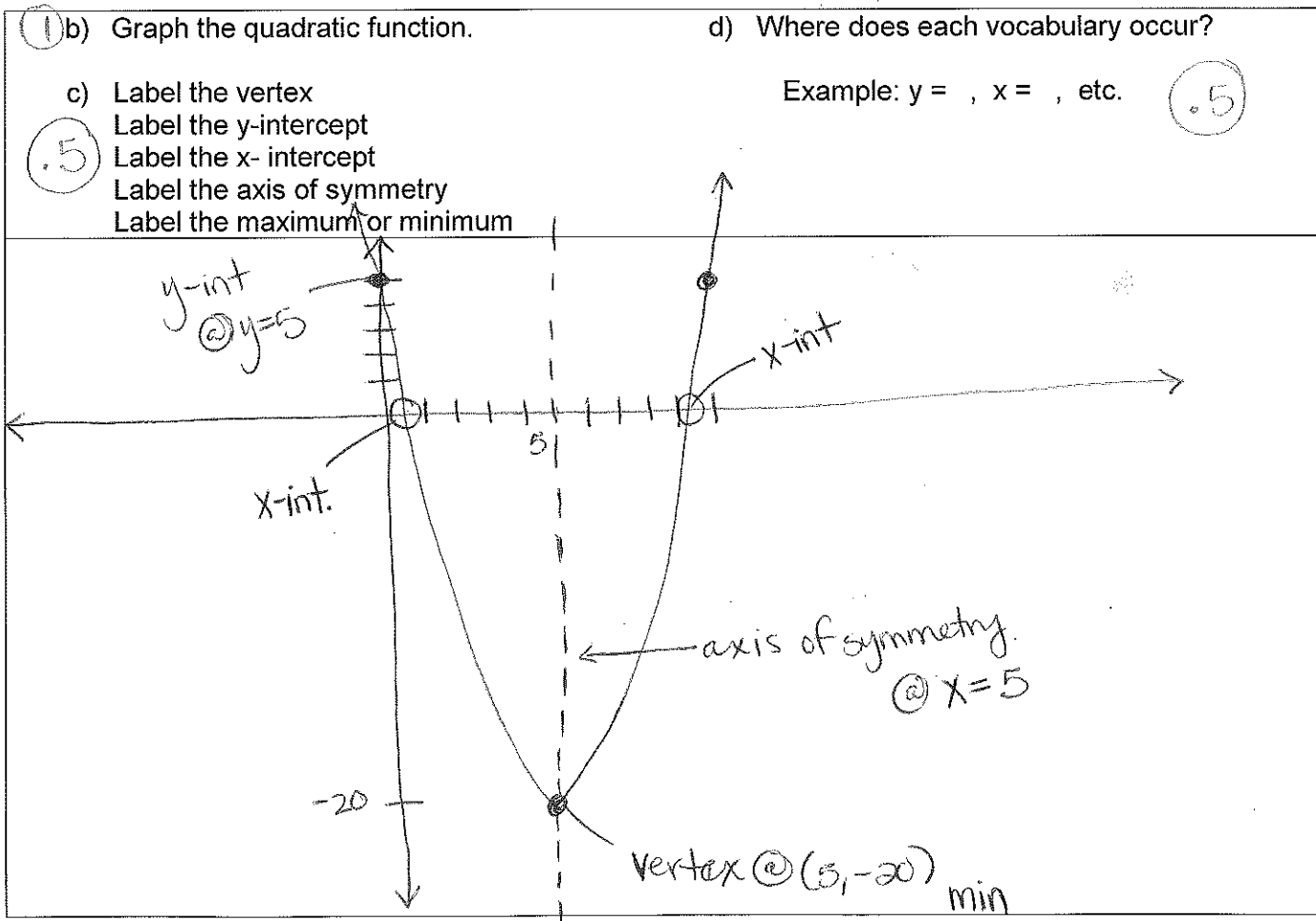
① y-int. @  $y=5$

① 
$$f(5) = 5^2 - 10(5) + 5$$

$$= 25 - 50 + 5$$

$$= -25 + 5 = -20$$

vertex @  $(5, -20)$



Good luck!


LT 3.2 Graphing: Max and Min

Score: 2

- 2) Determine whether the function has a maximum or a minimum, AND find that value.

$$f(x) = -x^2 + 4x - 1$$

- a) Show your work here.

$a = -1$   $b = 4$   $c = -1$   
↓  
negative 

$$x = \frac{-b}{2a} = \frac{-4}{2(-1)} = 2$$

$$f(2) = -(2)^2 + 4(2) - 1$$

$$= -4 + 8 - 1$$

$$= 4 - 1 = 3$$

vertex @ (2, 3)

①      ①  
Max @  $y = 3$

LT 3.2 & 3.3 Quick Check #2

LT 3.2-3.3a

Good luck!

LT 3.2 Graphing using the equation of the axis of symmetry

Score: 4

1) Graph the quadratic function  $f(x) = -x^2 - 4x + 10$  by using the equation of the axis of symmetry.  $a = -1$   $b = -4$   $c = 10$

a) Show your work here.

① y-int. @  $y = 10 \rightarrow +1$

$$x = \frac{-b}{2a}$$

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

①

$$f(-2) = -(-2)^2 - 4(-2) + 10$$

$$= -4 + 8 + 10$$

$$= 4 + 10 = 14 \rightarrow +1$$

vertex @  $(-2, 14)$

① b) Graph the quadratic function. +1

d) Where does each vocabulary occur?

c) Label the vertex +1

Example:  $y =$  ,  $x =$  , etc.

Label the y-intercept +1

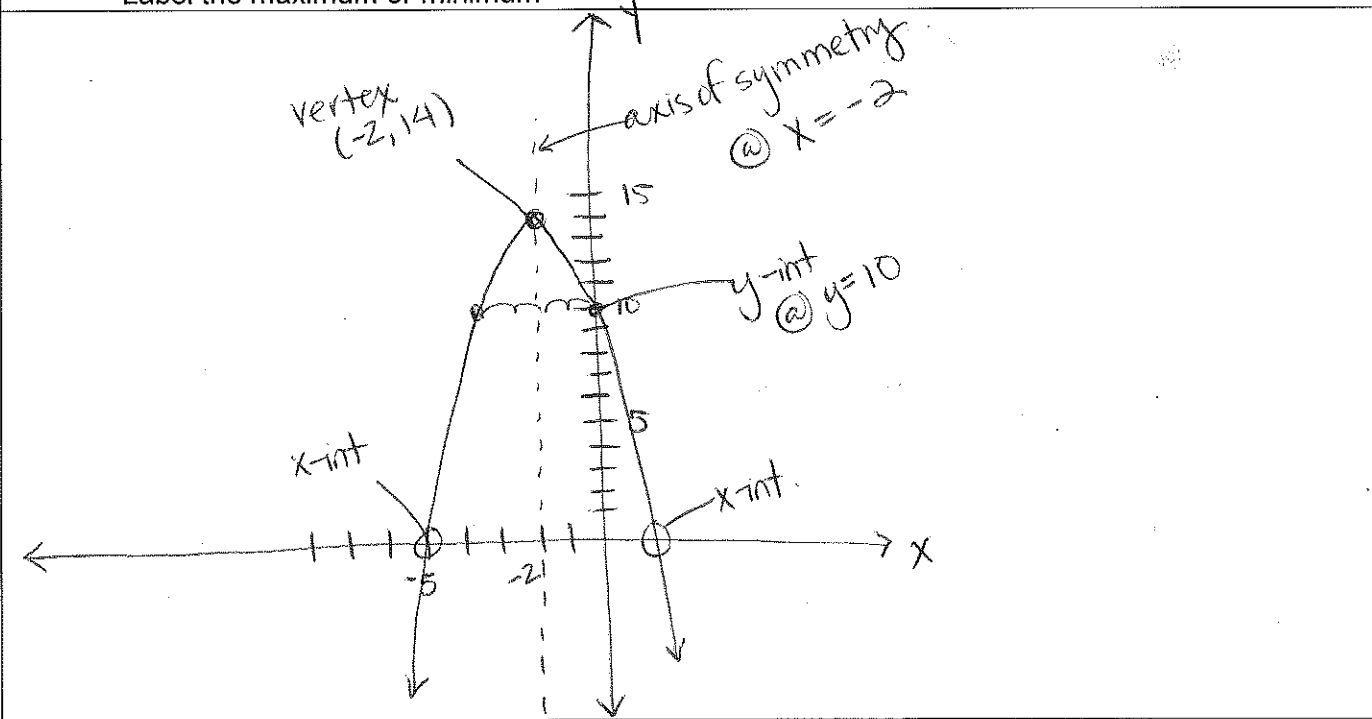
Label the x-intercept +1

Label the axis of symmetry +1

Label the maximum or minimum +1

#11

⑤



Good luck!

LT 3.2 Graphing: Max and Min

Score: 2

2) Determine whether the function has a maximum or a minimum, AND find that value.

$$f(x) = 2x^2 - 8x + 9$$

2

a) Show your work here.

$$a=2 \quad b=-8 \quad c=9$$

①

positive

U min

①

Min @ ~~y=2~~  
① y=1 → +1

②

$$x = \frac{-(-8)}{2(2)} = \frac{8}{4} = 2 \rightarrow +1$$

③

$$\begin{aligned} f(2) &= 2(2)^2 - 8(2) + 9 \\ &= 8 - 16 + 9 \\ &= -8 + 9 = 1 \end{aligned}$$

vertex @ (2, 1)

+1