

7.2 Notes

Wednesday, May 6, 2015 9:09 AM

7.2 Notes

- Vertex
 - The minimum or maximum value of a parabola
 - If a is positive, you will have a minimum value at your vertex
 - If a is negative, you will have maximum value at your vertex.
- Axis of Symmetry
 - Goes through the vertex
 - To find it, choose two points on the parabola have the same y -coordinate. Average the x -coordinates. That's the line through x . This will also be the x -coordinate in your vertex.
 - To find the y -coordinate, sub that value into your equation and solve y .
- Sketching Parabolas
 - Method 1: Make a table of values and sub into your equation. Plot those points.
- Domain and Range
 - The domain will always be all the real numbers (unless it is word problem where we cut off part of the parabola, but that's a different story).
 - Write it like this. $\{x|x \in R\}$
 - The range will be a subset of the real numbers.
 - It will be either $\{y|y \leq \#, y \in R\}$ if your graph opens down
 - OR $\{y|y \geq \#, y \in R\}$ if your graph opens up (because is greater to be happy).

7.2 Examples

Use the following equation for all of the questions below. $f(x) = -x^2 + 2x + 8$

1. Find the y -intercept

$$f(0) = -(0)^2 + (2(0)) + 8$$
$$f(0) = 8$$

2. Will this parabola have a max value or a min value?

Since $-x^2$ is neg. parabola opens down
∴ MAX value

3. Find the equation for the axis of symmetry.

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

* factor

$$\Rightarrow -x^2 + 2x$$

$(0, 8)$ and $(2, 8)$
 y -value must be same.

$$\frac{0 + 2}{2} = \frac{2}{2} = 1$$

$x = 1$ is axis of sym.

4. Find the vertex.

$$(1, 9)$$
$$f(1) = -(1)^2 + 2(1) + 8$$
$$= 9$$

5. Create a table of values.

Sub in for x

x	-2	-1	0	1	2	3	4	5
f(x)	0	5	8	9	8	5	0	-7

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

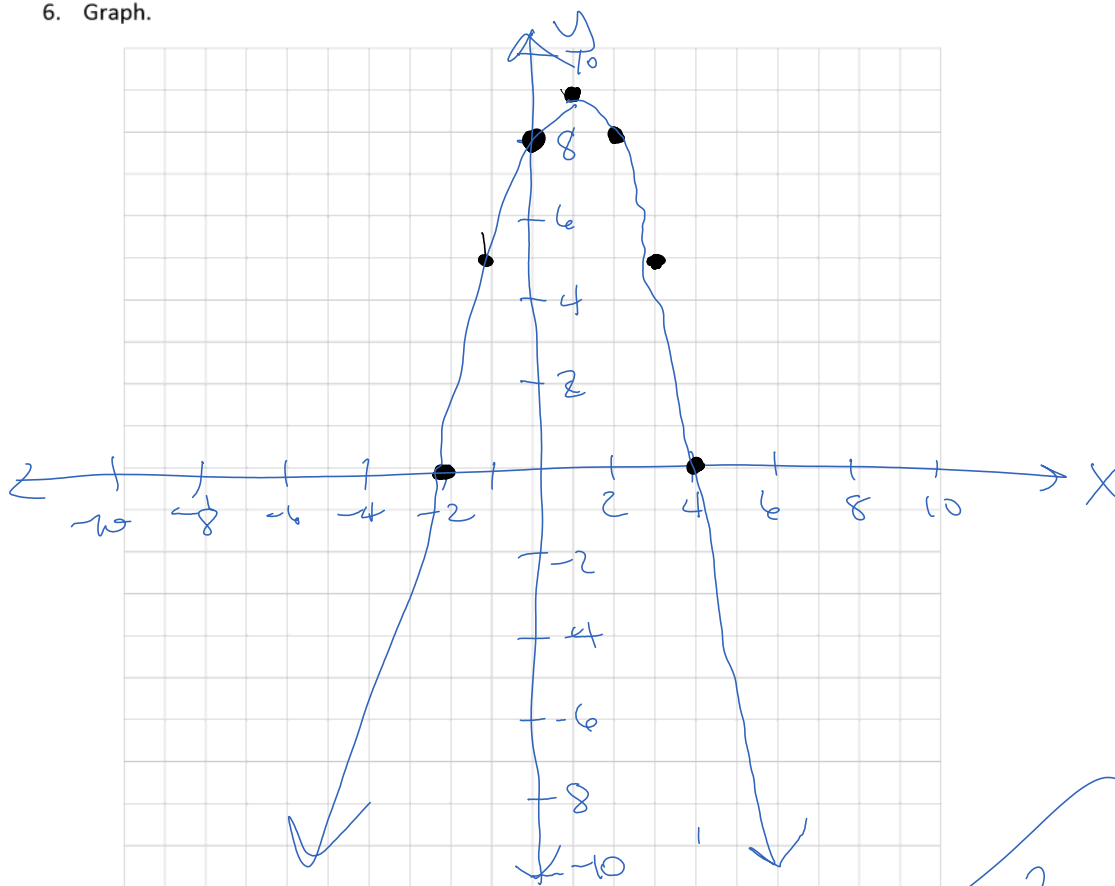
$$= 0$$

etc...

$$f(-1) = -(-1)^2 + 2(-1) + 8$$

$$= 5$$

6. Graph.



Domain: $\{x \mid x \in \mathbb{R}\}$

Range: $\{y \mid y \leq 9, y \in \mathbb{R}\}$

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