CHAPTER 12: QUADRATIC EQUATIONS

Graphing Quadratics Part #2 - Vertex Form

OBJECTIVES

- I can find the vertex of a quadratic function
- I can graph a quadratic function by finding the vertex & other critical points

PART 1: VERTEX FORM

- Not every quadratic function can be factored, so we need an alternate method to graph

Vertex Form

$$y = a(x - h)^2 + k$$

VERTEX: (h, k) **A o S:** x = h **DIRECTION:** a>0 = up, a<0= down

PART 1: VERTEX FORM

Example 1: Find the vertex of each quadratic. State if it is a maximum or minimum.

a. $y = (x - 1)^2$ b. $y = -(x - 1)^2 + 3$ c. $y = 2(x + 1)^2 + 4$ d. $y = -5(x + 3)^2 - 14$

Example 2: Write an equation of a quadratic with the given vertex.

a. (-3, 5) b. (5, 0) c. (7, -2)

PART 1: VERTEX FORM

Example 3: Graph $y = -(x - 5)^2 + 9$

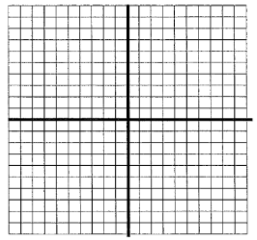
Opens: _____

Max/Min: _____

Vertex: _____

AOS: _____

X-Intercepts: _____



PART 1: VERTEX FORM

Example 4: Graph $y = 2(x + 4)^2 + 1$

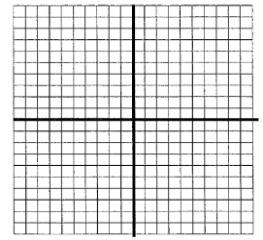
Opens: _____

Max/Min: _____

Vertex: _____

AOS: _____

X-Intercepts: _____



PART 2: CONVERTING TO VERTEX FORM

- In order to convert an equation from standard form ($y = ax^2 + bx + c$) to vertex form ($y = a(x - h)^2 + k$) you need to complete the square

- Convert to vertex form

1) $y = x^2 + 16x + 71$

2) $y = x^2 - 2x - 5$

PART 2: CONVERTING TO VERTEX FORM

- Convert to vertex form

3) $y = -x^2 - 14x - 59$

4) $y = 2x^2 + 36x + 170$

CAN YOU?? PROVE IT!!

- I can find the vertex of a quadratic function
- I can graph a quadratic function by finding the vertex & other critical points

Convert to vertex form and graph

$y = x^2 - 6x + 5$