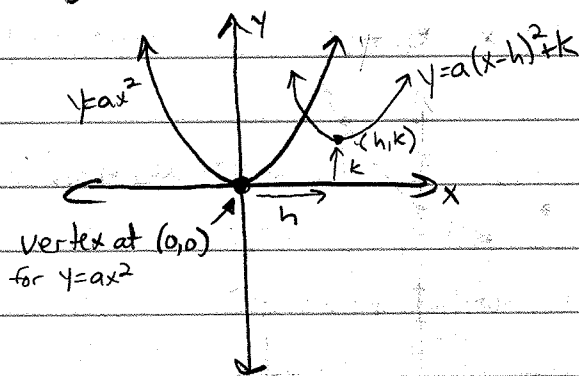


4.2 Graph Quadratics in Vertex Form

Standard Form of a quadratic: $y = ax^2 + bx + c$

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



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

- Vertex at (h,k)
- axis of symmetry at $x=h$
- Opens up if $a > 0$, down if $a < 0$

Graph in Vertex Form

$$y = (x+2)^2 - 3$$

1st - Find vertex

$$h = -2 \quad k = -3 \quad \rightsquigarrow (-2, -3)$$

2nd - Find y-intercept (plug 0 in for x)

$$y = (0+2)^2 - 3 \\ = 4 - 3 = 1$$

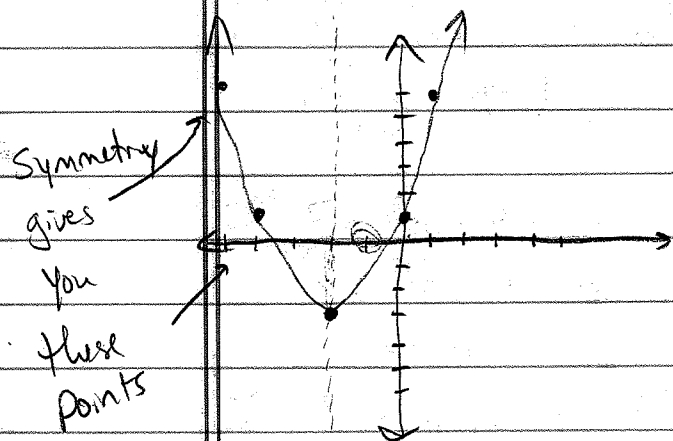
$$y = 1 \quad \rightsquigarrow \text{point at } (0, 1)$$

3rd - Find one more point

$$x = 1$$

$$y = (1+2)^2 - 3 \\ = 9 - 3 = 6 \quad \rightsquigarrow (1, 6)$$

4th - Plot & use symmetry to get other points



Graphs

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

$$y = \frac{1}{4}(x+2)^2 + 5$$

1st - vertex

$$(-2, 5)$$

2nd - y-intercept

$$y = \frac{1}{4}(0+2)^2 + 5$$

$$= \frac{1}{4}(4) + 5 = 6$$

$$y = 6 \quad (0, 6)$$

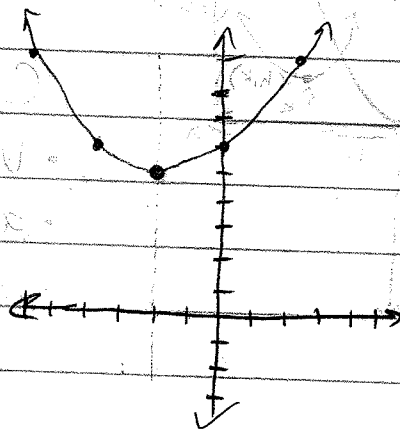
3rd - add a pt

$$x = 2$$

$$y = \frac{1}{4}(2+2)^2 + 5$$

$$= 4(16) + 5$$

$$y = 4 + 5 = 9 \quad (2, 9)$$



4th - Symmetry to get others!

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