

$$y = x^2 + 6x + 8$$

# Review of Chapter 6

Solve

Factor

$$y = x^2 + 6x + 8$$

$$y = (x+2)(x+4)$$

$$0 = (x+2)(x+4)$$

$$x+2=0 \quad x+4=0$$

$$x = -2 \quad x = -4$$

Roots = x-intercepts = zeros  
= solutions

Complete Square

$$x^2 + 6x + 8 = 0$$

$$x^2 + 6x + \underline{9} = -8 + \underline{9}$$

$$\sqrt{(x+3)^2} = \sqrt{1}$$

$$x+3 = \pm 1$$

$$x = -3 \pm 1 \rightarrow \begin{matrix} -2 \\ -4 \end{matrix}$$

Quadratic formula

$$a=1, b=6, c=8$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-6 \pm \sqrt{36 - 4(1)(8)}}{2} = \frac{-6 \pm 2}{2}$$

$$x = \frac{-4}{2} = -2$$

$$x = \frac{-8}{2} = -4$$

Graph

Graph in  $y=0$   
+ calculate the zeros.

Graph the Quadratic

$$y = x^2 + 6x + 8$$

$$x = \frac{-b}{2a} \quad \text{vertex: } (-3, -1)$$

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

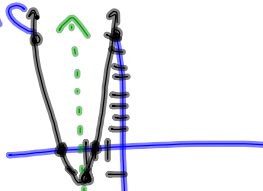
$$y = (-3)^2 + 6(-3) + 8$$

$$y = 9 - 18 + 8$$

$$y = -1$$

Axis:  $x = -3$

y-int:  $(0, c) = (0, 8)$



vertex form

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

$$y = x^2 + 6x + 8$$

$$y = (x^2 + 6x + 9) + 8 - 9$$

$$y = (x+3)^2 - 1$$

vertex:  $(h, k) = (-3, -1)$

axis:  $x = h, x = -3$

direction:  $a$  is  $(+)$  up