

## How to Graph Quadratics

$$y = x^2 - 3x - 4$$

Step 1:

Find the

roots by factoring

	$x$	$-4$
$x$	$x^2$	$-4x$
$1$	$x$	$-4$

$$0 = (x-4)(x+1)$$

$$\begin{array}{r} x-4 = 0 \\ +4 \quad +4 \\ \hline x = 4 \end{array}$$

$$\begin{array}{r} x+1 = 0 \\ x \quad -1 \\ \hline x = -1 \end{array}$$

$(4, 0)$   
 $(-1, 0)$

Step 2: Plot the roots on the

graph (x-axis)

Step 3: Find the

y-int

by

plug in  $x=0$  into the equation solve for  $y$

$$y = (0)^2 - 3(0) - 4$$

$$y = 0 - 0 - 4 \quad (0, -4)$$

$$y = -4$$

Step 4: Plot the y-intercept on the

graph (y-axis)

Step 5: Find the x-value of the vertex by

identifying the middle of the roots

$$-1 + 4 = \frac{3}{2} = 1.5 \quad x = 1.5$$

Step 6: Find the y-value of the vertex by

plug in  $x=1.5$  into the equation

$$y = (1.5)^2 - 3(1.5) - 4$$

$$y = 2.25 - 4.5 - 4 = y = -6.25$$

Step 7: Plot the vertex on the graph and connect all points with a smooth curve.

$$(1.5, -6.25)$$

