

For Homework:

Find the key features for the following equations of parabolas and fill in the table below. Do all your work in your notebook.

1. $y = x^2 + 8x + 15$

2. $y = 2x^2 + 5x - 3$

Expanded Form	$y = x^2 + 8x + 15$	$y = 2x^2 + 5x - 3$
Factored Form	$y = (x+5)(x+3)$	$y = (2x-1)(x+3)$
Key Features		
Opens Up/Down	Up	Up
y-intercept	$(0, 15)$	$(0, -3)$
x-intercepts	$(-3, 0)$ $(-5, 0)$	$(0.5, 0)$ $(-3, 0)$
Line of Symmetry	$x = -4$	$x = -1.25$
Vertex	$(-4, -1)$	$(-1.25, -6.125)$

1. $y = x^2 + 8x + 15$ $y\text{-int: } (0, 15)$

$$x^2 + 5x + 3x + 15$$
$$x(x+5) + 3(x+5)$$
$$(x+3)(x+5)$$

$$\begin{array}{r} \swarrow \\ x+3=0 \\ -3 \quad -3 \\ \hline x=-3 \end{array}$$

$$\begin{array}{r} \searrow \\ x+5=0 \\ -5 \quad -5 \\ \hline x=-5 \end{array}$$

$x\text{-ints: } (-3, 0)$
 $(-5, 0)$

Line of Symmetry:

$$\frac{-3 + -5}{2} = \frac{-8}{2} = -4$$
$$x = -4$$

Vertex:

$$y = (x+3)(x+5)$$
$$y = (-4+3)(-4+5)$$
$$y = (-1)(1)$$
$$y = -1$$
$$(-4, -1)$$

2. $y = 2x^2 + 5x - 3$

$2x^2 + 6x - x - 3$

y-int

$2x$	$2x^2$	$6x$
-1	$-x$	-3
	x	3

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

x-ints:

$2x - 1 = 0$

$\begin{array}{r} +1 \quad +1 \\ \hline 2x = 1 \\ \frac{2x}{2} = \frac{1}{2} \end{array}$

$x = 0.5$

$x + 3 = 0$

$\begin{array}{r} -3 \quad -3 \\ \hline x = -3 \end{array}$

LOS

$x = \frac{0.5 + -3}{2}$

$x = \frac{-2.5}{2} = -1.25$

x-ints: $(0.5, 0)$ $(-3, 0)$

Vertex

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

$= (2(-1.25) - 1)(-1.25 + 3)$

$= (-2.5 - 1)(1.75)$

$= (-3.5)(1.75)$

$= -6.125$

Vertex: $(-1.25, -6.125)$