You can only solve a quadratic equation using square roots if the equation is:

1. In Standard Form $(ax^2 + bx + c = 0)$ and there is no linear term.
   $ax^2 + c = 0$

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

Find the exact solutions to each:

3. $2(x + 3)^2 - 1 = 31$

$+1 \quad +1$

$\frac{2(x+3)^2}{2} = \frac{32}{2}$

$\sqrt{(x+3)^2} = \sqrt{16}$

$x + 3 = \pm 4$

$-3 \quad -3$

$x = +4 - 3$ or $-4 - 3$

$x = 1, -7$

4. $(x - 2)^2 + 11 = 51$

$-11 \quad -11$

$\sqrt{(x-2)^2} = \sqrt{40} = \sqrt{4 \cdot 10}$

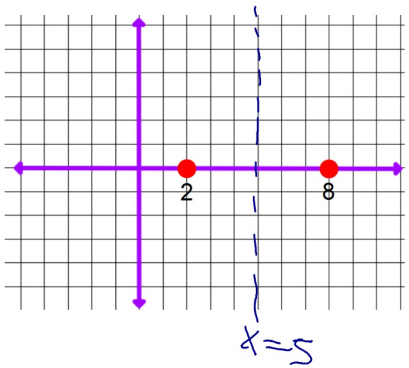
$x - 2 = \pm 2\sqrt{10}$

$+2 \quad +2$

$x = \pm 2\sqrt{10} + 2$

$= 2 \pm 2\sqrt{10}$

The x-intercepts of a parabola are 2 and 8, find the equation for the Line of Symmetry.



The LOS is located exactly in the middle of the x-intercepts:

It is their Mean!

LOS: $x = \frac{2+8}{2} = 5$

Forms for the Equation of a Quadratic

Standard Form	Vertex Form	Intercept Form (Factored Form)
$y = ax^2 + bx + c$	$y = a(x - h)^2 + k$	$y = (x+5)(x-1)$ x-intercepts are zeros of the factors.
LOS: $x = \frac{-b}{2a}$	Vertex: (h,k)	X-INT $-5, 1$
Vertex: $(\frac{-b}{2a}, \quad)$	LOS: x = h	LOS is the avg of the x-int: LOS $x = \frac{-5+1}{2} = -2$
y - int: Replace x with zero C	y - int: Replace x with zero it is NOT k	LOS is the x-coord of the Vertex: $(-2, -9)$ $(3)(-3)$
		Y-INT: $(5)(-1) = -5$

to find the y-int replace x with zero

Use this factored form of a quadratic.

$y = (x - 3)(x + 5)$

1. Find the x-intercepts. $0 = (x - 3)(x + 5)$

   $x = 3, -5$

   find the zeros of each factor

2. Find the LOS

   LOS $x = \frac{3 + -5}{2} = -1$

3. Find the Vertex

   $(-1, -16)$ $(-1-3)(-1+5) = (-4)(4)$

4. What is the y-intercept?

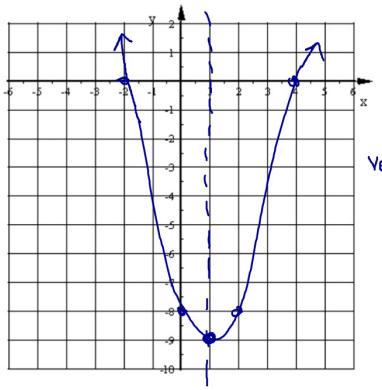
   $(0-3)(0+5) = (-3)(5) = -15$

Intercept Form (Factored Form)

$Y = (x-m)(x+n)$

1. Find x-intercepts first: $0 = (x - m)(x + n)$ zeros of each factor
2. Find LOS: x = average of the x-int
3. Find the Vertex (LOS,) replace x with LOS and find y
4. Find y-int: Replace x with zero. = product of the constants in each factor

Graph this parabola: $y = (x-4)(x+2)$



x-int: 4, -2

LOS $x = 1$

Vertex $(1, -9)$ $(-3)(3)$

y-int $(-4)(2) = -8$