



Finding Equations of Quadratic Relations in Standard Form: $y = ax^2 + bx + c$

Video Notes

[Video Link](#)

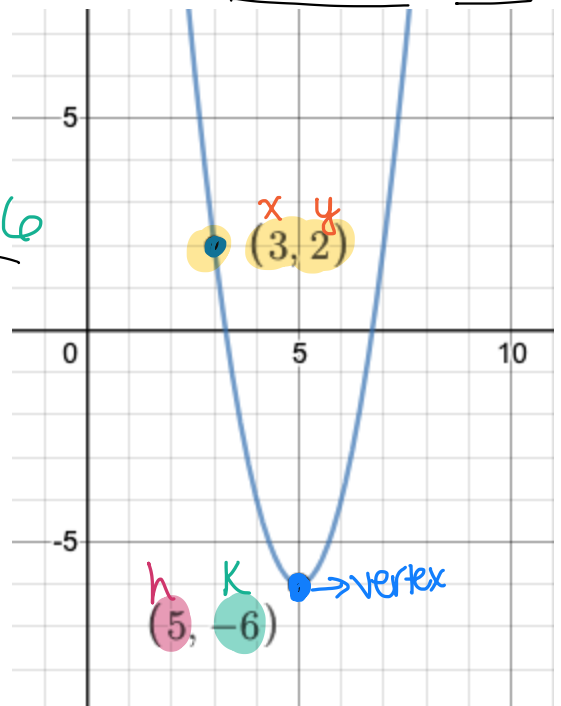
Finding Equations of Quadratic Relations in Standard Form: $y = ax^2 + bx + c$

Background Information:

- Standard form of a quadratic relation
- Finding equations of quadratic relations in vertex form $y = a(x-h)^2 + k$
- Finding equations of quadratic relations in factored form $y = a(x-r)(x-s)$
- Multiply binomial by binomial (FOIL/Box)

Find the equation of the quadratic relation below in standard form.

vertex form \rightarrow use when given a vertex
 factored form \rightarrow use when given roots



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

$$y = a(x-5)^2 - 6 \rightarrow y = 2(x-5)^2 - 6$$

$$2 = a(3-5)^2 - 6$$

$$2 = a(-2)^2 - 6$$

$$2 = 4a - 6$$

$$8 = 4a$$

$$2 = a$$

vertex form
 EXPAND and
 SIMPLIFY!

$$(x-5)^2$$

$$(x-5)(x-5)$$

$$x^2 - 10x + 25$$

$$y = 2(x-5)^2 - 6$$

$$y = 2(x^2 - 10x + 25) - 6$$

$$y = 2x^2 - 20x + 50 - 6$$

$$y = 2x^2 - 20x + 44$$

Find the equation of the quadratic relation below in standard form.

• vertex form \rightarrow vertex

• factored form \rightarrow roots

$$y = a(x-r)(x-s)$$

$$y = a(x - (-8))(x - 3)$$

$$y = a(x + 8)(x - 3)$$

$$6 = a(0 + 8)(0 - 3)$$

$$6 = a(8)(-3)$$

$$6 = -24a$$

$$\frac{-6}{24} = a$$

$$\frac{-6 \div 6}{24 \div 6} = \frac{-1}{4}$$

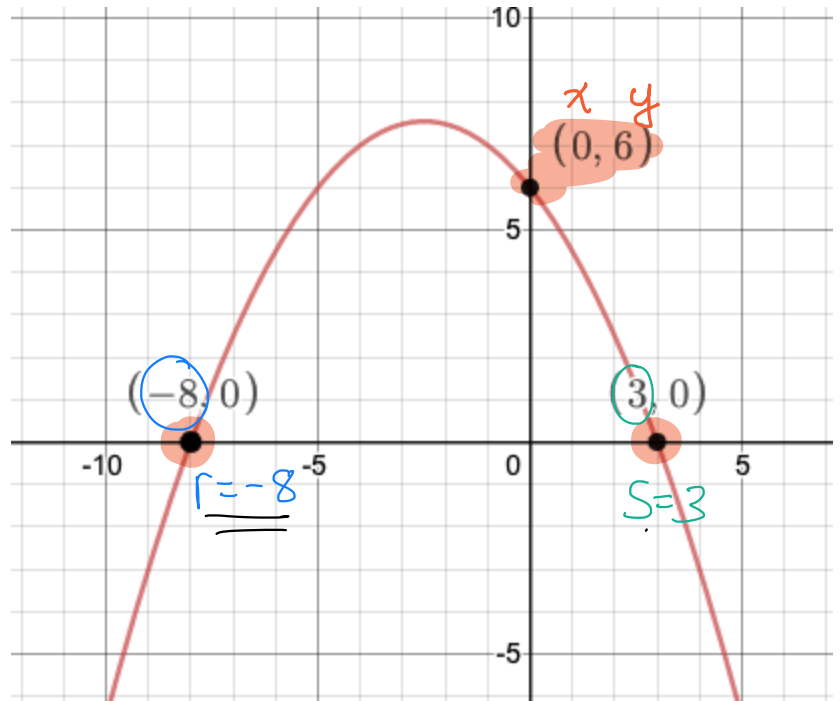
$$a = -\frac{1}{4}$$

$$y = a(x + 8)(x - 3)$$

$$y = -\frac{1}{4}(x + 8)(x - 3)$$

$$y = -\frac{1}{4}(x^2 + 5x - 24)$$

$$y = -\frac{1}{4}x^2 - \frac{5}{4}x + 6$$



EXPAND + SIMPLIFY!
 $(x + 8)(x - 3)$

Summary:

- Use **vertex form** if given the **vertex** and **another point**.
- Use **factored form** if given the **roots** and **another point**.
- **Expand and simplify** to write the equation in **standard form**.