

5.5 – EVALUATING AND WRITING QUADRATIC FUNCTIONS

OBJECTIVES:

- 1) Evaluate a quadratic function at a certain value of x .
- 2) Given the output, determine the input of a quadratic function.
- 3) Write an equation of a quadratic to represent a given graph or a list of data.

EVALUATING QUADRATIC FUNCTIONS

Ex 1) $f(x) = 3x^2 + 2x - 11$

Find: a) $f(-4)$

b) x , if $f(x) = -6$

c) the x – intercepts

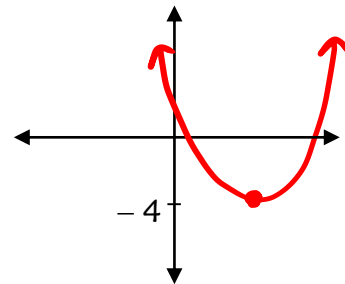
- Be able to calculate y when you know x
- Be able to calculate x when you know y

Ex 2) If $f(x) = 3x^2 + 2x - 11$, does $f(x)$ ever equal

a) -5

b) -15

(4)



This function will **NEVER** equal -10 .

WRITING QUADRATIC EQUATIONS

We have already written equations of quadratics from graphs OR when given the vertex and an additional point.

REVIEW:

- 3) Find the equation of a quadratic when the vertex is at (6, 3) and the point (4, 10) lies on the parabola.

SIDE NOTE:

When writing a linear equation, $y = mx + b$, you need 2 points!

WHAT IF WE ARE NOT GIVEN THE VERTEX??

Ex 4) Find the equation of a quadratic function containing (-2, -11), (4, 13), (6, 29).

Ex 5) Find the equation of a quadratic function containing (0, 5), (2, 13), and (3, 26).

Plu in pts: $y = ax^2 + bx + c$

$$\begin{aligned}(0 \) \quad 5 &= a(0)^2 + b(0) + c \\ 5 &= 0a + 0b + c\end{aligned}$$

$$\begin{aligned}(2 \ 3) \quad 13 &= a(2)^2 + b(2) + c \\ 13 &= 4a + 2b + c\end{aligned}$$

$$\begin{aligned}(3 \ 6) \quad 26 &= a(3)^2 + b(3) + c \\ 26 &= 9a + 3b + c\end{aligned}$$

$$\left\{ \begin{array}{l} +c = 5 \\ + \quad = 13 \end{array} \right.$$

$$A = \begin{bmatrix} 0 & 0 & 1 & 5 \\ 4 & 2 & 1 & 13 \\ 9 & 3 & 1 & 26 \end{bmatrix}$$

$$\text{rref } A = \begin{bmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & -2 \\ 0 & 0 & 1 & 5 \end{bmatrix}$$

$$(a, b, c)$$

$$(3, -2, 5)$$

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