

Section 1.4: Linear Functions and Models

Essential Question:

What is the zero of a function?

A function describes a dependent relationship between quantities.

For instance, the value of $y=2x+1$ depends on the x - value. $\therefore y$ is dependent on x - value

Read as " $2x+1$ is a function of x "

This is written as: $f(x) = 2x+1$
 \uparrow replaces "y-value"

making the x -value the independent

$$f(1) = 2(1)+1 = 3 \quad (1, 3)$$

$$f(0) = 2(0)+1 = 1 \quad (0, 1)$$

$$f(-\frac{1}{2}) = 2(-\frac{1}{2})+1 = 0 \quad (-\frac{1}{2}, 0) \leftarrow \text{the } \# x = -\frac{1}{2} \text{ is the zero of function } f$$

If $f(\text{number}) = 0$ then that **number** is called a Zero of function f .

Also known as: zero \Rightarrow root \Rightarrow xint

Language

$$f(x) = 3x - 2$$

f is a function of x ; in terms of x

$$r(t) = .2t + 23$$

r is a function of t ; in terms of t

Example

The senior class is renting the LaCrosse Center Ballroom for \$400 for their Fall Festival dance.

Tickets for the dance are \$8 per person.

- a) Express the net income (I) as a function of the number (n) of tickets sold.

$$I(n) = 8n - 400$$

- b) Graph the function. How many tickets must be sold for the seniors to begin making a profit?

1st find zero of $f(x)$

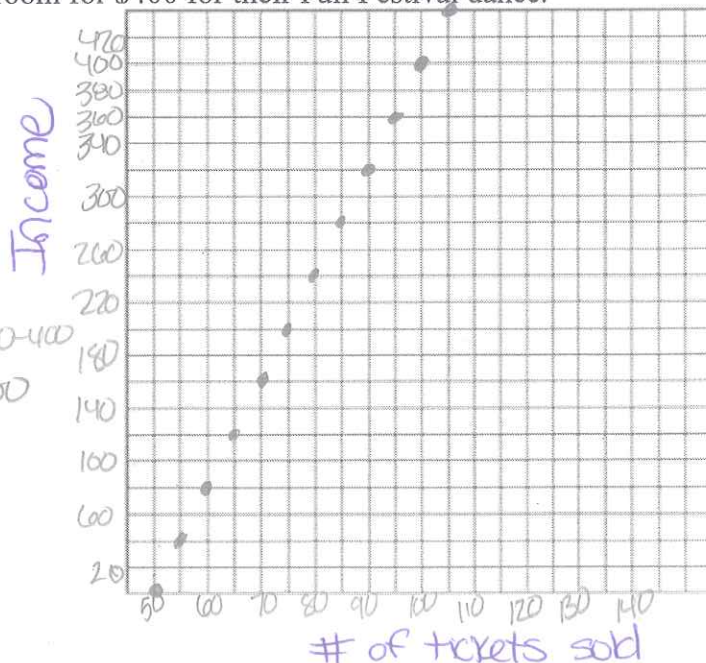
$$0 = 8n - 400$$

$$8n = 400$$

$$n = 50 \rightarrow (50, 0) \text{ tickets, \$}$$

$$f(100) = 8(100) - 400 = 400$$

Need to sell 51 tickets or more to make profit



Section 1.4 Summary:

The zero of a function is where the graph crosses the x-axis. The zero(s) of a function are x-intercepts, also known as roots.

To find the zero of the function, set the equation equal to zero and solve for x . Once solved, the answer can be written as a coordinate $(x, 0)$.