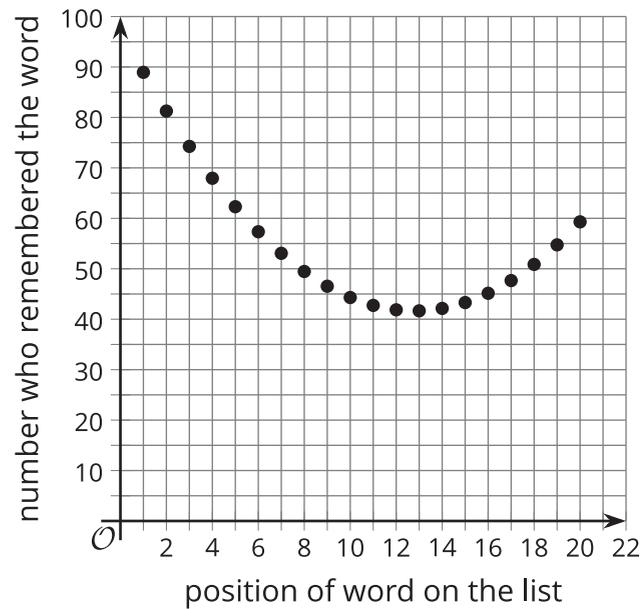


Unit 7 Lesson 2: Equations and Graphs

1 The Word List (Warm up)

Student Task Statement

A group is asked to memorize a list of 20 words, then recall as many as possible later. An equation that models the relationship between the position of the word on the list, n , and the number of people in the group who remembered the word, P , is $P = 0.34n^2 - 8.7n + 97.3$.



What do you notice? What do you wonder?

2 Seeing Solutions

Student Task Statement

1. A person is hiking from the top of a mountain into a valley. The function $2,000 - 32t$ represents their elevation in feet above sea level, t minutes after they started their hike.
 - a. What does a solution to the equation $2000 - 32t = 0$ mean?
 - b. Use technology to create a graph of $y = 2,000 - 32t$. Where do you see the solution to that equation on the graph?
2. A new electronic device originally costs \$1,000 but loses \$175 worth of value every year.
 - a. Write a function that represents the worth of the device after s years.
 - b. How many years until the device is worth \$0?
 - c. Use technology to graph the function. Where can you see the solution to your equation on the graph?

3 Understanding Solutions in Situations

Student Task Statement

- The expression $5.25 + 0.85x$ represents the amount a yogurt shop charges for yogurt with x ounces of toppings.
 - What does the equation $5.25 + 0.85x = 7.08$ mean in this situation?
 - What would a solution to this equation mean?
 - Use technology to graph $y = 5.25 + 0.85x$. Where can you see the solution to the equation on the graph?
- Drinks cost \$1.50, sandwiches cost \$4.00, and there is a flat delivery fee of \$5 for each delivery regardless of the number of orders.
 - Write an expression that represents the amount it costs to have x meals including a drink and a sandwich delivered to an office.
 - Write an equation that has a solution representing the number of drink and sandwich orders it would take to cost \$80.
 - Graph $y = 1.5x + 4x + 5$. Where can you see the solution to the equation on the graph?
- The temperature in a deep freezer in a laboratory is -40 degrees Celsius. The freezer breaks, so the temperature starts to rise by 2.5 degrees per hour.
 - Use technology to graph $y = -40 + 2.5x$.
 - Explain how to use this graph to find the time (after breaking) when the freezer temperature reaches 0 degrees Celsius.
- The expression $400 - 10x^2$ represents the height in meters of an object above the ground x seconds after falling off a 400 meter building.
 - Write an equation that has a solution that would give the time in seconds when the object hit the ground.
 - Use technology to graph $y = 400 - 10x^2$ and explain where you can see the solution to your equation on the graph.