

Name: _____

Class: _____

Units and Other Topics

Systems Problem

1) A gardener is planting two types of trees:

Type A is three feet tall and grows at a rate of 15 inches per year.

Type B is four feet tall and grows at a rate of 10 inches per year.

Algebraically determine exactly how many *days* it will take for these trees to be the same height. Assume 1 year = 365 days.

Domain Questions

<p>1)</p> <p>Which domain would be the most appropriate set to use for a function that predicts the number of household online-devices in terms of the number of people in the household?</p> <ol style="list-style-type: none">1) integers2) whole numbers3) irrational numbers4) rational numbers	<p>2)</p> <p>The daily cost of production in a factory is calculated using $c(x) = 200 + 16x$, where x is the number of complete products manufactured. Which set of numbers best defines the domain of $c(x)$?</p> <ol style="list-style-type: none">1) integers2) positive real numbers3) positive rational numbers4) whole numbers
<p>3)</p> <p>A construction company uses the function $f(p)$, where p is the number of people working on a project, to model the amount of money it spends to complete a project. A reasonable domain for this function would be</p> <ol style="list-style-type: none">1) positive integers2) positive real numbers3) both positive and negative integers4) both positive and negative real numbers	<p>4)</p> <p>At an ice cream shop, the profit, $P(c)$, is modeled by the function $P(c) = 0.87c$, where c represents the number of ice cream cones sold. An appropriate domain for this function is</p> <ol style="list-style-type: none">1) an integer ≤ 02) an integer ≥ 03) a rational number ≤ 04) a rational number ≥ 0

5)

A store sells self-serve frozen yogurt sundaes. The function $C(w)$ represents the cost, in dollars, of a sundae weighing w ounces. An appropriate domain for the function would be

- 1) integers
- 2) rational numbers
- 3) nonnegative integers
- 4) nonnegative rational numbers

6)

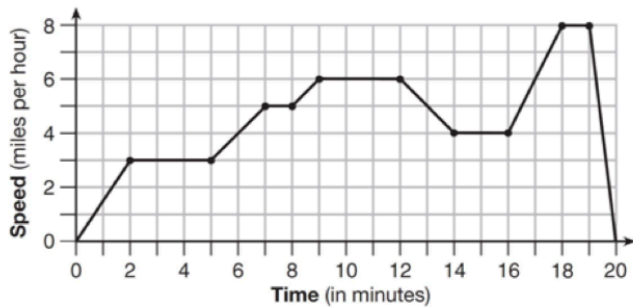
An online company lets you download songs for \$0.99 each after you have paid a \$5 membership fee. Which domain would be most appropriate to calculate the cost to download songs?

- 1) rational numbers greater than zero
- 2) whole numbers greater than or equal to one
- 3) integers less than or equal to zero
- 4) whole numbers less than or equal to one

Graph Questions

1)

The graph below represents a jogger's speed during her 20-minute jog around her neighborhood.

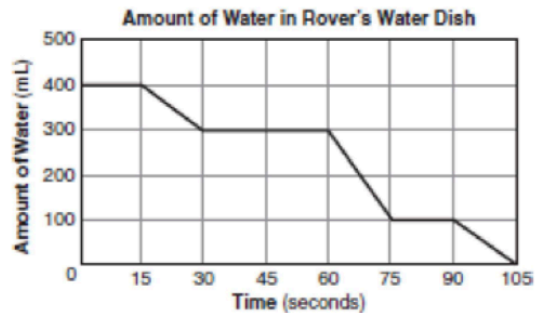


Which statement best describes what the jogger was doing during the 9–12 minute interval of her jog?

- 1) She was standing still.
- 2) She was increasing her speed.
- 3) She was decreasing her speed
- 4) She was jogging at a constant rate.

2)

The accompanying graph show the amount of water left in Rover's water dish over a period of time.



How long did Rover wait from the end of his first drink to the start of his second drink of water?

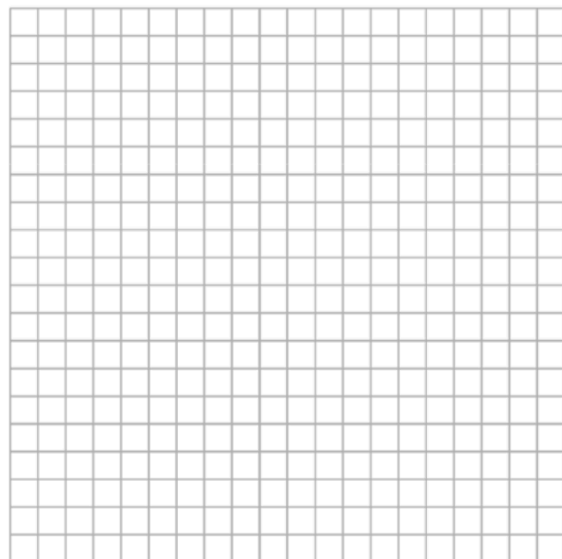
- 1) 10 sec
- 2) 30 sec
- 3) 60 sec
- 4) 75 sec

3)

During a snowstorm, a meteorologist tracks the amount of accumulating snow. For the first three hours of the storm, the snow fell at a constant rate of one inch per hour. The storm then stopped for two hours and then started again at a constant rate of one-half inch per hour for the next four hours.

a) On the grid below, draw and label a graph that models the accumulation of snow over time using the data the meteorologist collected.

b) If the snowstorm started at 6 p.m., how much snow had accumulated by midnight?



Rate Problems

1)

The distance traveled is equal to the rate of speed multiplied by the time traveled. If the distance is measured in feet and the time is measured in minutes, then the rate of speed is expressed in which units? Explain how you arrived at your answer.

3)

The distance from Earth to Mars is 136,000,000 miles. A spaceship travels at 31,000 miles per hour. Determine, to the *nearest day*, how long it will take the spaceship to reach Mars.

2)

A two-inch-long grasshopper can jump a horizontal distance of 40 inches. An athlete, who is five feet nine, wants to cover a distance of one mile by jumping. If this person could jump at the same ratio of body-length to jump-length as the grasshopper, determine, to the *nearest jump*, how many jumps it would take this athlete to jump one mile.

4)

An airplane leaves New York City and heads toward Los Angeles. As it climbs, the plane gradually increases its speed until it reaches cruising altitude, at which time it maintains a constant speed for several hours as long as it stays at cruising altitude. After flying for 32 minutes, the plane reaches cruising altitude and has flown 192 miles. After flying for a total of 92 minutes, the plane has flown a total of 762 miles. Determine the speed of the plane, at cruising altitude, in miles per minute. Write an equation to represent the number of miles the plane has flown, y , during x minutes at cruising altitude, only. Assuming that the plane maintains its speed at cruising altitude, determine the total number of miles the plane has flown 2 hours into the flight.