MATH 100 SOLUTIONS: QUIZ VII 1ST NOVEMBER 2018

1. *[4 pts]* The temperature at the base of a mountain in the land of Oz is 90° F and decreasing by 5° F for every thousand-foot increase in elevation

(a) Find a function, T(h), which expresses the temperature in degrees Fahrenheit at an elevation of h thousand-feet.

Answer: $T(h) = 90 - 5h$

(b) What does T(4) = 55 mean?

Answer: $T(4) = 55$ *means that when your elevation is 4 thousand feet above the base of the mountain, the temperature is* $55°\ F$.

2. *[4 pts]* Let $f(x) = x^2 + 3$

(a) Find f(-2).

Solution: $f(-2) = (-2)^2 + 3 = \mathbf{7}$

(b) Find $\frac{f(1)+1}{f(2)-1}$

Solution: $\frac{f(1)+1}{f(2)-1} = \frac{4+1}{7-1} = \mathbf{\frac{5}{6}}$

(c) Find f (1 + f(2))

Solution: $f(1 + f(2)) = f(1 + 7) = f(8) = \mathbf{67}$

(d) Find f (1 + f(1) + f(2))

Solution: $f(1 + f(1) + f(2)) = f(1 + 4 + 7) = f(12) = \mathbf{147}$

3. *[2 pts]* At the University of Oz, at the end of the semester, students' math grades are listed in a table that gives each student's ID number in the left column and the student's grade in the right column. Let N represent the ID number and G represent the grade. Which quantity, N or G, must necessarily be a function of the other?

Solution: G *is a function of* N, *namely* $G = f(N)$.

Each ID number determines a student that then determines the grade.

On the other hand, knowing the grade does not determine who the student is.

4. *[6 pts]* Match each story about a bike ride to one of the graphs (i)–(v), where d represents distance from home and t is time in hours since the start of the ride. (A graph may be used more than once.)

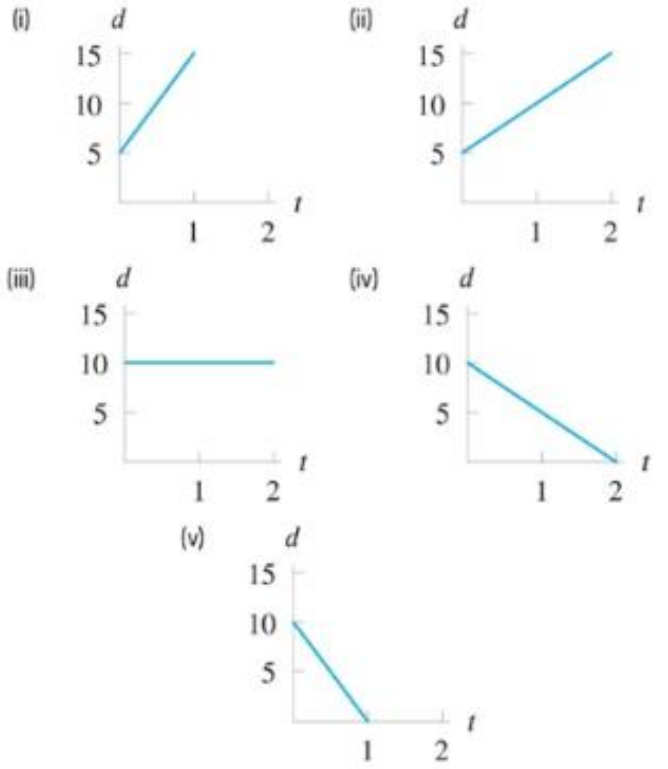
(a) Starts 5 miles from home and rides 5 miles per hour away from home.

(b) Starts 5 miles from home and rides 10 miles per hour away from home.

(c) Starts 10 miles from home and arrives home one hour later.

(d) Starts 10 miles from home and is halfway home after one hour.

(e) Starts 5 miles from home and is 10 miles from home after one hour.



Answers:

Story (a): (ii)

Story (b): (i)

Story (c): (v)

Story (d): (iv)

Story (e): (ii)

5. *[6 pts]* Ten inches of snow is equivalent to about one inch of rain.

(a) Write an equation for the amount of precipitation, measured in inches of rain, r = f(s), as a function of the number of inches of snow, s.

Answer: $r = f(s) = \frac{1}{10}\, s$

(b) Find and interpret f (5).

Solution:

$$f(5) = \left(\frac{1}{10}\right)(5) = \frac{1}{2}$$

This means that 5 inches of snow is the equivalent of ½ inch of rain.

(c) Find s such that f(s) = 5 and interpret your result.

Solution: If s = 50 then f(50) = 5. This means that 50 inches of snow is the equivalent of 5 inches of rain.