Name:_____

MATH 150: QUIZ 7 (3.1–3.2)

1. Consider the function $f(x) = -2x + 6$. Compute the average rate of change of f and determine if f increasing, decreasing, or constant.

2. Consider the data

x	$f(x)$
-1	-2
0	1
1	4
2	7
3	10

   Is the function a linear function? If yes, determine the slope.

3. The cost C, in dollars, of renting a moving truck for a day is given by the function

$$C(x) = 0.25x + 40,$$

   where x is the number of miles driven. If the cost of renting the truck was \$120, how many miles did you drive?

4. Suppose a small bicycle manufacturer has daily fixed costs of \$1800, and each bicycle costs \$80 to manufacture. Write a linear function that expresses the cost of manufacturing x bicycles in a day.

$$C(x) = \boxed{}.$$

5. Suppose $f(x) = 3x + 6$. Solve $f(x) \geq 0$.

Solutions

1. The average rate of change of a linear function is just the slope. In this case, the slope is -2. Since the average rate of change is negative, the linear function is decreasing.
2. We verify that for each change in x by 1, $f(x)$ changes by 3. That means that f is a linear function with slope 3.
3. We compute

$$\begin{aligned} 0.25x + 40 &= 120 \\ 0.25x &= 80 \\ x &= 320. \end{aligned}$$

   You drove 320 miles.
4. $C(x) = 1800 + 80x$
5. $[-2, \infty)$