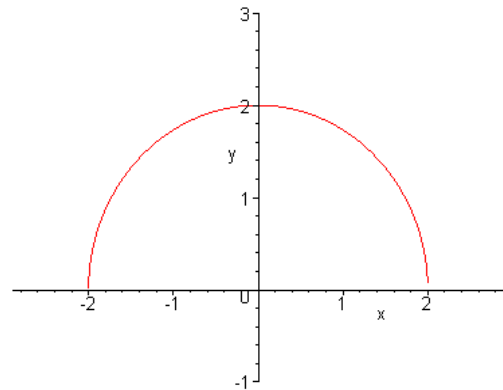


The first 8 questions are multiple choice. Circle the letter of the best answer. Each question is worth 4 points.

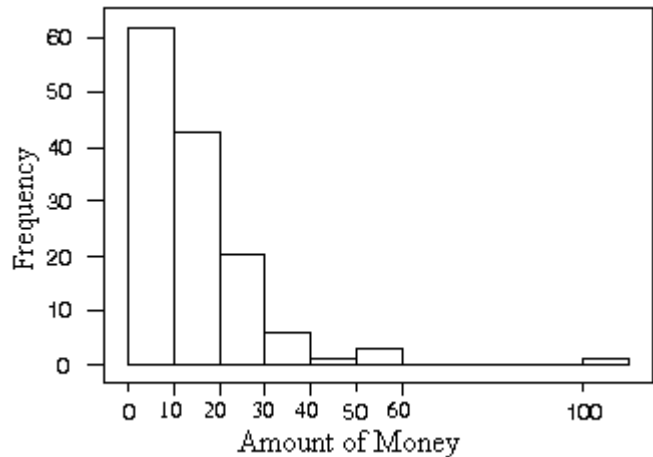
1. Given the following graph of g , which of the following is correct?

- a) The domain of g is $0 \leq x \leq 2$ and the range is $-2 \leq g(x) \leq 2$.
- b) The domain of g is $-2 \leq x \leq 2$ and the range is $0 \leq g(x) \leq 2$.
- c) The domain of g is all real numbers and the range is all real numbers.
- d) The domain of g is $x \geq 0$ and the range is $g(x) \geq 0$.



2. In a statistics class with 136 students, the professor records how much money each student has in his or her possession during the first class of the semester. The histogram below shows the data collected. Based on this histogram:

- a) The mean is smaller than the median.
- b) The mean is larger than the median.
- c) The mean and the median are approximately the same.
- d) There is no way to tell the relationship between the mean and median by just looking at a histogram.



3. Two variables are said to be negatively associated if

- a) above average values of one variable tend to accompany below average values of the other.
- b) above average values of one variable tend to accompany above average values of the other.
- c) below average values of one variable tend to accompany below average values of the other.
- d) below average values of one variable can be accompanied by either above or below average values of the other.

4. The graph of $y = 1.5^x$ can be described as:

- a) Increasing and concave up.
- b) Increasing and concave down.
- c) Decreasing and concave up.
- d) Decreasing and concave down.

5. Based on the following electric bill, which piecewise function best describes the cost of electricity given the amount of electricity used where $f(k)$ is the cost for k total kWh units of electricity?

First 400 kWh × \$0.085	\$34.00
Next 300 kWh × \$0.078	\$23.40
Next 140 kWh × \$0.062	\$8.68
840 kWh total	Total electric \$66.08

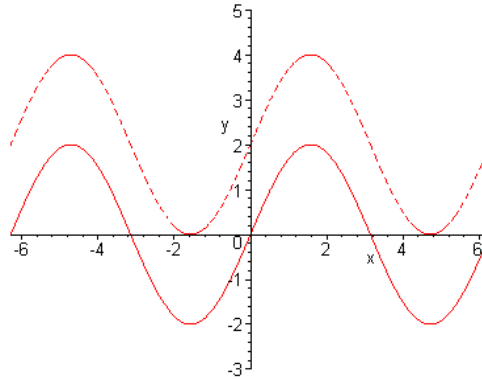
- a) $f(k) = \begin{cases} 0.085k, & \text{if } k \leq 400 \\ 0.078k & \text{if } 400 < k \leq 700 \\ 0.062k & \text{if } k > 700 \end{cases}$
- b) $f(k) = \begin{cases} 0.085k, & \text{if } k \leq 400 \\ 34 + 0.078(k - 400) & \text{if } 400 < k \leq 700 \\ 57.4 + 0.062(k - 700) & \text{if } k > 700 \end{cases}$
- c) $f(k) = \begin{cases} 0.085k, & \text{if } k \leq 400 \\ 0.078(400 - k) & \text{if } 400 < k \leq 700 \\ 0.062(700 - k) & \text{if } k > 700 \end{cases}$
- d) $f(k) = \begin{cases} 0.085k, & \text{if } k \leq 400 \\ 0.078(k - 400) & \text{if } 400 < k \leq 700 \\ 0.062(k - 700) & \text{if } k > 700 \end{cases}$

6. Suppose that after this test, I determined the mean, median, and standard deviation for the scores. I then added 10 points to each test score and recalculated the mean, median, and standard deviation. Which of the following would NOT change?

- a) Mean
- b) Median
- c) Standard Deviation
- d) The above three of these measures would change.

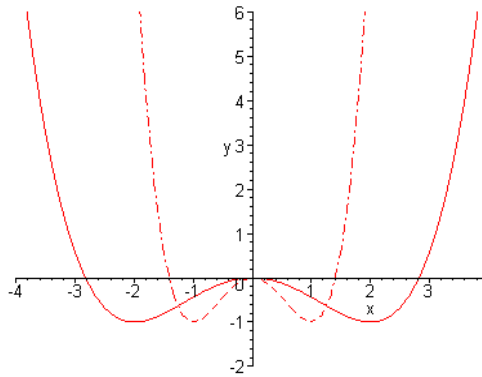
7. The following is a graph of solid curve is a graph of $y = h(x)$. The equation for the dashed curve above $y = h(x)$ is

- a) $y = h(x + 2)$.
- b) $y = h(x) + 2$.
- c) $y = 2h(x)$.
- d) $y = h(2x)$.

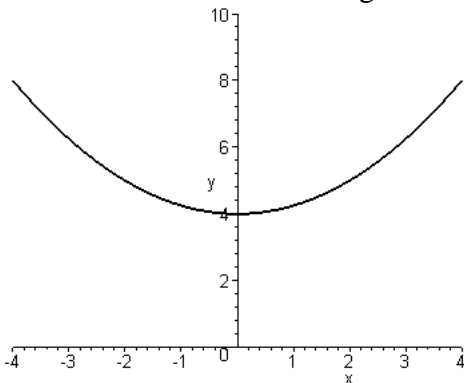


8. The following is a graph of solid curve is a graph of $y = g(x)$. The equation for the dashed curve is

- a) $y = g(2x)$.
- b) $y = g(0.5x)$.
- c) $y = 2g(x)$.
- d) $y = 0.5g(x)$.



9. Use the terms y -intercept, x -intercept, increasing, decreasing, concave up, and concave down to describe the following function. (8 points)



10. Use your calculator to determine the point of intersection of $f(x) = 3x - 4$ and $g(x) = -2x - 2$. (4 points)

11. Let f be a linear function whose slope is 6. Suppose $f(1) = 8$. What is $f(2)$? What is $f(5)$? (6 points)

12. The following table gives men's shoe sizes and the length of men's feet in inches. This relationship is linear. (14 points)

Shoe size	7	8	9	10	11
Foot length (in)	$9\frac{2}{3}$	10	$10\frac{1}{3}$	$10\frac{2}{3}$	11

- What is the slope of the function where the input is shoe size and the output is foot length in inches?
- What does the slope from part (a) mean in terms of shoe size and foot length?
- Suppose someone has a size 5 shoe, what is the length of his foot?
- What size shoe corresponds to a foot length of a foot (12 inches)?

13. Suppose a presidential candidate proposed a flat tax system in which a person's income is taxed at a rate of 15% on all income above \$15,000. The first \$15,000 is not taxed at all. Complete the following piecewise function for this where a person's income is the input and the tax they owe is the output. (6 points)

$$f(x) = \begin{cases} & \text{if } x \leq 15,000 \\ & \text{if } x > 15,000 \end{cases}$$

14. Compute the following if $f(x) = \begin{cases} 3-2x & \text{if } x \leq 0 \\ x^2-3 & \text{if } x > 0 \end{cases}$. (6 points)

- $f(2)$
- $f(-2)$

15. The data below represents the total costs of textbooks purchased by 18 Hope students for the spring semester 2002. (18 points)

338, 160, 210, 180, 166, 272, 128, 409, 240, 250, 160, 300, 340, 200, 194, 132, 202, 180

- a) Create a histogram (manually or from your calculator) of the data, where each interval is of width 50. (The first bar will be $100 \leq x < 150$, the second class will cover $150 \leq x < 200$, etc.)

- b) Use the 1-Var Stats on your calculator to find:

Mean _____

Median _____

Standard Deviation _____

Q_1 _____

Q_3 _____

16. The xy -line on the right shows the world record time for the mile run given the year. (6 points)

- a) Approximately, what was the world record time in 1920?
- b) Approximately, what was the world record time in 1990?
- c) Approximately, what year did the first runner run in less than 4 minutes?

