

The following multiple choice questions are worth 5 points each.

1. Which of the following could NOT be the value of a correlation coefficient?

- a. 1
- b. 2.8
- c. .5747
- d. .4791
- e. .7763

2. Solve for  $x$ :  $\frac{x+2}{3} + \frac{x}{5} = 2$ .

Which of the following statements is true about the solution to this equation?

- a.  $x$  is between  $-2$  and  $0$ .
- b.  $x$  is between  $0$  and  $2$ .
- c.  $x$  is between  $2$  and  $4$ .
- d.  $x$  is between  $4$  and  $6$ .
- e.  $x$  is between  $6$  and  $8$ .

3. A full-price ticket for a college basketball game cost \$2.50, and a student ticket cost \$1.75. If 585 tickets were sold, and the total receipts were \$1,217.25, how many were student tickets?

- a. 258
- b. 327
- c. 253
- d. 184
- e. None of the preceding

4. Use the discriminant to determine the number of real solutions of the following quadratic equation.

$$-2x^2 + 6x - 5 = 0$$

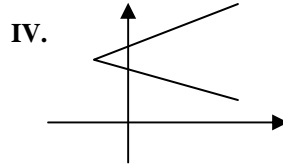
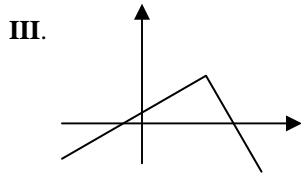
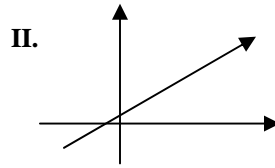
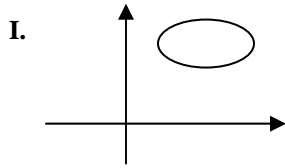
- a. Two real solutions
- b. No real solutions
- c. One real solution
- d. None of the preceding

5. Use the quadratic formula to solve:  $x^2 - 5x + 3 = 0$
- a.  $\frac{5 \pm \sqrt{13}}{2}$
- b.  $\frac{-5 \pm \sqrt{13}}{2}$
- c.  $\frac{5 \pm \sqrt{38}}{2}$
- d.  $\frac{25 \pm \sqrt{13}}{2}$
6. The base of a triangle is one third as long as its height. If the area of the triangle is 24 square meters, how long is the base?
- a. 24 meters
- b. 4 square meters
- c. 12 meters
- d. 72 meters
7. The height of a projectile fired upward with an initial velocity of 400 feet per second is given by the formula  $h = -16t^2 + 400t$ , where  $h$  is the height in feet and  $t$  is the time in seconds. Find the required time for the object to return to its point of departure.
- a. 16 seconds
- b. 40 seconds
- c. 400 seconds
- d. 25 seconds
8. The graph of the equation  $x = 4$  is
- a. A horizontal line 4 units above the  $x$  - axis.
- b. A vertical line 4 units to the left of the  $y$  - axis.
- c. A line with slope = 4
- d. A vertical line 4 units to the right of the  $y$  - axis.
- e. None of the preceding.

9. The graph of the equation  $y = 4$  is
- A horizontal line 4 units above the  $x$  – axis.
  - A vertical line 4 units to the left of the  $y$  – axis.
  - A line with slope = 4
  - A vertical line 4 units to the right of the  $y$  – axis.
  - None of the preceding.
10. Find the  $x$  and  $y$  intercepts of  $3x + 7y = 4$
- $x$  – int = 3 and  $y$  – int = 7
  - $x$  – int = 7 and  $y$  – int = 3
  - $x$  – int =  $\frac{4}{3}$  and  $y$  – int =  $\frac{4}{7}$
  - $x$  – int =  $-\frac{4}{3}$  and  $y$  – int =  $-\frac{4}{7}$
11. Write the equation of the line that passes through the point  $P(2, 5)$  and is parallel to  $4x - y = 7$ .
- $y = -\frac{1}{4}x + \frac{9}{2}$
  - $y = -4x + 7$
  - $y = 4x - 3$
  - $y = \frac{1}{4}x + \frac{9}{2}$

12. Write the equation of the line that passes through the point  $P(2, 5)$  and is perpendicular to  $4x - y = 7$ .
- a.  $y = -\frac{1}{4}x + \frac{11}{2}$
  - b.  $y = -4x + 7$
  - c.  $y = 4x - 3$
  - d.  $y = \frac{1}{4}x + \frac{9}{2}$
  - e. none of the preceding.
13. A house purchased for \$125,000 is expected to appreciate according to the formula  $y = 7,500x + 125,000$ , where  $y$  is the value of the house after  $x$  years. Find the value of the house 5 years later.
- a. \$130,000
  - b. \$162,500
  - c. \$625,000
  - d. \$16,2500
14. Find the vertex of the parabola:  $y = -4x^2 + 3x + 4$ .
- a.  $\left(\frac{3}{8}, \frac{73}{16}\right)$
  - b.  $\left(\frac{-3}{8}, \frac{73}{16}\right)$
  - c.  $(0, 4)$
  - d.  $(4, 0)$
  - e.  $\left(\frac{73}{16}, \frac{3}{8}\right)$

15. Which of the following graphs represent a function?



- a. I, II, III and IV all represent functions
- b. II, III and IV represent functions
- c. II and III represent functions
- d. III and IV represent functions
- e. None of the given represent functions

16. Find the inverse of the given function:  $y = 2x - 4$

- a.  $y = 2x + 4$
- b.  $y = 4x - 2$
- c.  $y = \left(\frac{x+4}{2}\right)$
- d.  $y = -2x + 4$

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Instructor: \_\_\_\_\_

**Free response (10 points)**

17. Regression could be used to determine what effect cold weather has on the number of shoppers that visit a mall. The Paradise Mall did a study in which a random sample of days were chosen and the number of shoppers visiting the mall each day was counted. Let  $x$  = the noonday temperature (in degrees Fahrenheit) and  $y$  = the number of customers visiting the mall.

$x$	0	10	20	30	40
$y$	200	300	1000	1500	1700

- a. Find the equation of the regression line. Carry out the coefficients to two decimal places.

Answer: \_\_\_\_\_

- b. Find the correlation coefficient (use all decimal places available).

Answer: \_\_\_\_\_

- c. Predict the number of shoppers on a  $25^\circ$  day.

Answer: \_\_\_\_\_

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Instructor: \_\_\_\_\_

**Free response (10 points)**

18. Using the information below:

- a) Graph the data. Make an educated guess as to whether the scenario indicates **a constant function, a linear function, a quadratic function, or none of these types of functions.**
- b) Create a table of values (by hand – not with the calculator) and, using the method of common differences, verify your guess.

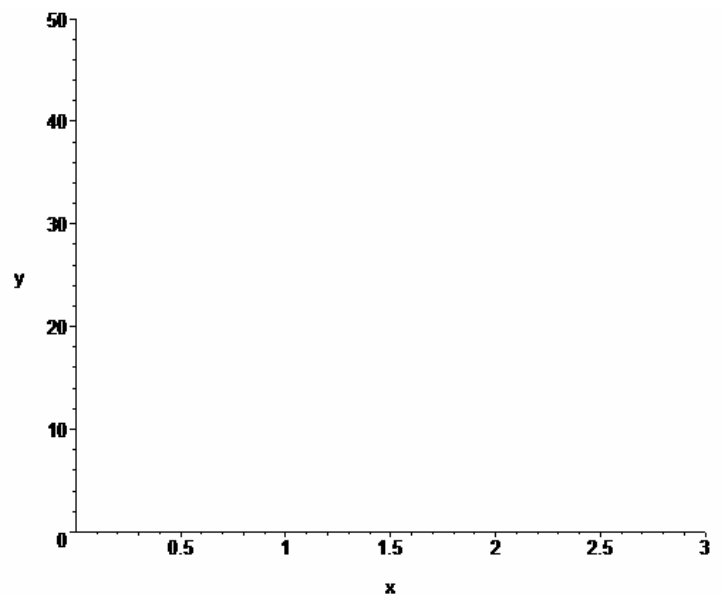
A ball is thrown up in the air and the height of the ball, above the ground, is measured after a given number of seconds. The following are the results of those measurements:

- At 0 seconds, the height of the ball is 8 feet.
- At 0.5 seconds, the height of the ball is 28 feet.
- At 1.0 seconds, the height of the ball is 40 feet.
- At 1.5 seconds, the height of the ball is 44 feet.
- At 2.0 seconds, the height of the ball is 40 feet.
- At 2.5 seconds, the height of the ball is 28 feet.

a.

Seconds	Height	Common Differences (cd)	
		cd	cd of cd

b.



The scenario indicates:

\_\_\_\_\_

Multiple choice answer key:

1. B
2. C
3. B
4. B
5. A
6. B
7. D
8. D
9. A
10. C
11. C
12. A
13. D
14. A
15. C
16. C

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Instructor: \_\_\_\_\_

**Free response (10 points)**

17. Regression could be used to determine what effect cold weather has on the number of shoppers that visit a mall. The Paradise Mall did a study in which a random sample of days were chosen and the number of shoppers visiting the mall each day was counted. Let  $x$  = the noonday temperature (in degrees Fahrenheit) and  $y$  = the number of customers visiting the mall.

$x$	0	10	20	30	40
$y$	200	300	1000	1500	1700

- a. Find the equation of the regression line. Carry out the coefficients to two decimal places.

Answer:  $y = 42x + 100$

- b. Find the correlation coefficient (use all decimal places available).

Answer:  $r = .9759527659$

- c. Predict the number of shoppers on a 25° day.

Answer: 1150 shoppers

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Instructor: \_\_\_\_\_

Free response (10 points)

18. Using the information below:

- a) Graph the data. Make an educated guess as to whether the scenario indicates a **constant function**, a **linear function**, a **quadratic function**, or **none of these types of functions**.
- b) Create a table of values (by hand – not with the calculator) and, using the method of common differences, verify your guess.

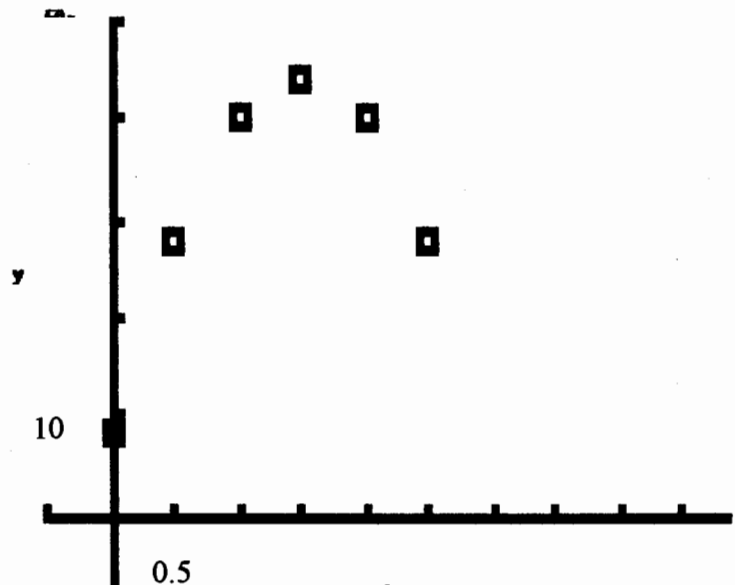
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- At 1.0 seconds, the height of the ball is 40 feet.
- At 1.5 seconds, the height of the ball is 44 feet.
- At 2.0 seconds, the height of the ball is 40 feet.
- At 2.5 seconds, the height of the ball is 28 feet.

a.

Seconds	Height	Common Differences (cd)	
		cd	cd of cd
0	8		
0.5	28	20	
1.0	40	12	-8
1.5	44	4	-8
2.0	40	-4	-8
2.5	28	-12	-8

b.



The scenario indicates:

**Quadratic Function**