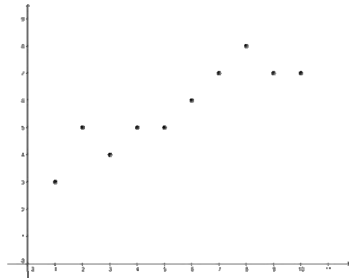


## End-of-Course Test

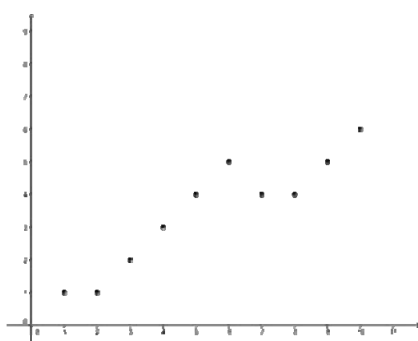
**Select the best answer.**

1. Which is the correlation coefficient?



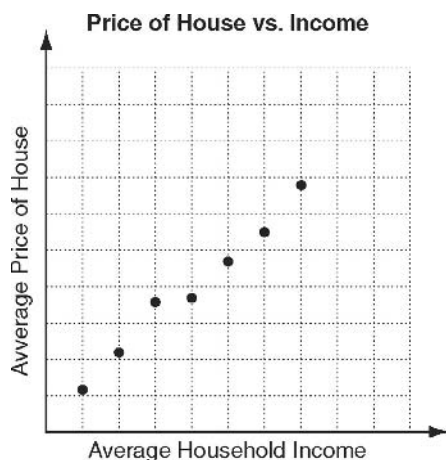
- A 1                                      C -0.90  
 B 0.90                                    D -1

2. Which is the correlation coefficient?



- F 1                                          H 0.55  
 G 0.93                                    J 0.26

3. An economist graphs the average price of houses versus average household income in a town over a number of years.



Which correlation coefficient makes sense for this relationship?

- A -0.94                                    C 0.15  
 B -0.15                                    D 0.94

4. A company that makes nails takes samples from their production line to test for quality. The results of one week's samples are shown below.

Length of Nail	0.9"–1"	1.1"–1.3"	1.4"–1.6"
Frequency	89	47	11

What is the experimental probability that a nail chosen at random is between 1.1 and 1.3 inches long?

- F 0.32                                      H 0.43  
 G 0.35                                      J 0.47
5. Which monomial has the highest degree?
- A  $2a^2b^2c^2d^2$                           C  $9abc^7$   
 B  $2a^5b^3c^2$                               D  $9a^9$
6. What are the zeros of the trinomial  $3x^2 - 8x + 4$ ?

F  $-2, -\frac{2}{3}$

G  $-\frac{2}{3}, 2$

H  $-2, \frac{2}{3}$

J  $\frac{2}{3}, 2$

7. Write a quadratic function in standard form having zeros of 4 and  $-\frac{1}{2}$ .

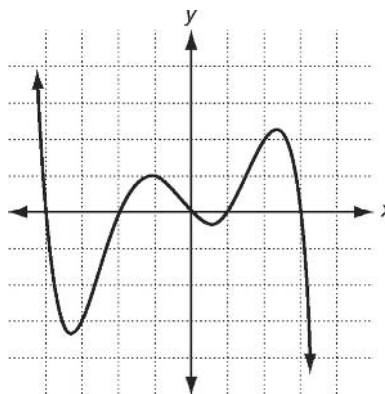
- A  $a(x) = 2x^2 - 7x - 4$   
 B  $b(x) = 2x^2 - 7x + 4$   
 C  $c(x) = 2x^2 + 7x - 4$   
 D  $d(x) = 2x^2 + 7x + 4$

## End-of-Course Test

*continued*

8. If 4 and  $(2 + \sqrt{5})$  are two of the roots of a fourth-degree polynomial with integer coefficients, which of the following could be the set of all of the roots?
- F  $\{2 - \sqrt{5}, 4, 2 + \sqrt{5}\}$   
 G  $\{2 - \sqrt{5}, \sqrt{5}, 4, 2 + \sqrt{5}\}$   
 H  $\{3, 4, 2 + \sqrt{5}, 7\}$   
 J  $\{2 - \sqrt{5}, 3 - \sqrt{2}, \sqrt{5}, 4, 3 + \sqrt{2}, 2 + \sqrt{5}\}$
9. Which function has a maximum value of 10?
- A  $f(x) = -2x^2 + 4x - 12$   
 B  $g(x) = -2x^2 + 8x + 2$   
 C  $h(x) = -x^2 + 6x + 10$   
 D  $j(x) = x^2 - 4x + 14$
10. Write  $f(x) = 2x^2 - 8x + 10$  in vertex form.
- F  $f(x) = 2(x - 2)^2 + 2$   
 G  $f(x) = 2(x - 2)^2 + 6$   
 H  $f(x) = 2(x - 4)^2 - 22$   
 J  $f(x) = 2(x - 4)^2 - 6$
11. Which is equal to  $(2x + y)^5$ ?
- A  $32x^5 + 80x^4y + 80x^3y^2 + 40x^2y^3 + 10xy^4 + y^5$   
 B  $32x^5 + 64x^4y + 128x^3y^2 + 64x^2y^3 + 16xy^4 + y^5$   
 C  $32x^5 + 16x^4y + 8x^3y^2 + 4x^2y^3 + 2xy^4 + y^5$   
 D  $32x^5 + y^5$

12. If  $(1 - \sqrt{2})$  and  $(2 - 3\sqrt{2})$  are two of the roots of a fourth degree polynomial with integer coefficients, what is the product of the other two roots?
- F  $-8 - 5\sqrt{2}$       H  $8 - 5\sqrt{2}$   
 G  $-8 + 5\sqrt{2}$       J  $8 + 5\sqrt{2}$
13. Which statement about the function shown must be true?

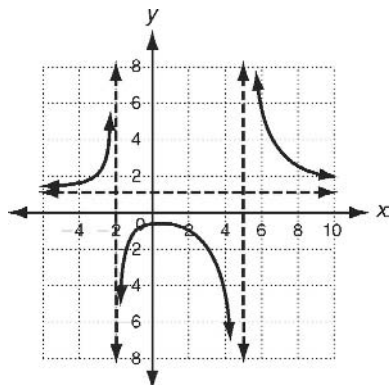


- A Its leading coefficient is positive.  
 B It has a pair of non-real roots.  
 C Its constant term is zero.  
 D It has a double root.
14. Which is equal to  $\frac{\frac{2}{x} - 1}{\frac{1}{x} - 1}$ ?
- F  $\frac{2 - x}{x - 1}$       H  $\frac{x - 2}{x - 1}$   
 G  $\frac{1 - x}{x - 2}$       J  $\frac{x - 1}{x - 2}$

## End-of-Course Test

*continued*

15. Which could be the equation for the graph?



A  $a(x) = \frac{x^2 + x + 6}{x^2 - 3x - 10}$

B  $b(x) = \frac{x^2 + x + 6}{x^2 + 3x - 10}$

C  $c(x) = \frac{2x^2 + x + 6}{x^2 - 3x - 10}$

D  $d(x) = \frac{2x^2 + x + 6}{x^2 + 3x - 10}$

16. The population of a city was 125,000 in 2000 and has increased at the rate of 0.3% since then. Which function represents the city's population  $t$  years after 2000?

F  $f(x) = 125,000(1.003)^t$

G  $f(x) = 125,000(1.03)^t$

H  $f(x) = 125,000(0.003)^t$

J  $f(x) = 125,000(0.03)^t$

17. What is the 38th term of the arithmetic sequence 19, 26, 33, 40, ...?

A 271                      C 285

B 278                      D 292

18.  $P$  varies jointly with  $Q$  and  $R$ , and  $P = 6$  when  $Q = 3$  and  $R = 12$ . Find  $P$  when  $Q = 4$  and  $R = 16$ .

F 6                          H 10

G 8                          J  $10\sqrt{6}$

19. A laser printer prints 135 pages in 5 minutes. How many pages does it print in 22 minutes?

A 110                      C 594

B 220                      D 2970

20. The price of one share of a company's stock  $S$  is tied to its annual profits  $p$  in millions of dollars according to the function  $S = 0.1\sqrt{p-100}$ . If the company sells one share of its stock for \$1.84, what is the best approximation of the company's profits that year?

F \$101 million        H \$339 million

G \$134 million        J \$439 million

21. Solve  $3^{x+2} = 10$ .

A  $\frac{1-2\log 3}{\log 3}$               C  $\log 3 - 2$

B  $\frac{1+2\log 3}{\log 3}$               D  $\log 3 + 2$

22. What is the sum of the solutions of the equation  $2\log_9(3x-1) = \log_9(6x+1)$ ?

F  $\frac{4}{3}$                           H  $\frac{8}{3}$

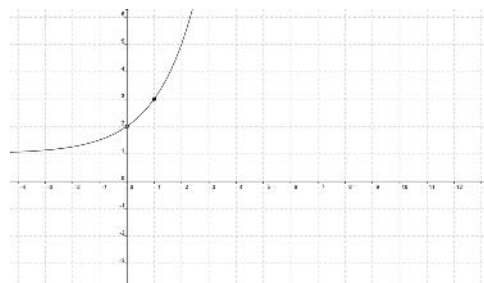
G 2                          J There is no solution.

23. Which of the following functions is an example of exponential growth?

A  $a(x) = 0.5(1.2)^x$     B  $b(x) = 0.86x^{2.4}$

C  $c(x) = 1.2x + 0.5$     D  $d(x) = 2.4(0.86)^x$

24. This is the graph of which function?



F  $f(x) = 2^x + 1$         H  $f(x) = \log_x + 2$

G  $f(x) = x^2 + 1$         J  $f(x) = x + 2$

## End-of-Course Test

*continued*

25. The graph of which function has a period of 2?

A  $y = 2\tan x$       C  $y = \cot \frac{\pi}{2} x$

B  $y = \tan 2x$       D  $y = \cot \pi x$

26. Which is the value of  $\cos 2\phi$  if

$\cos \phi = \frac{5}{13}$  and  $0^\circ < \phi < 90^\circ$ ?

F  $-\frac{144}{169}$       H  $-\frac{8}{13}$

G  $-\frac{119}{169}$       J  $-\frac{3}{13}$

27.  $f(x) = \begin{cases} 2x + 4 & \text{if } x < 2 \\ 4x & \text{if } x \geq 2 \end{cases}$  and

$g(x) = f(2x)$ . What is  $g(x)$ ?

A  $g(x) = \begin{cases} x + 4 & \text{if } x < 1 \\ 2x & \text{if } x \geq 1 \end{cases}$

B  $g(x) = \begin{cases} x + 4 & \text{if } x < 4 \\ 2x & \text{if } x \geq 4 \end{cases}$

C  $g(x) = \begin{cases} 4x + 4 & \text{if } x < 1 \\ 8x & \text{if } x \geq 1 \end{cases}$

28. If  $g(x)$  is a horizontal compression by a factor of  $\frac{1}{4}$  followed by a translation of 3 units down of  $f(x) = 4x - 5$ , what is the rule for  $g(x)$ ?

F  $g(x) = x - 2$       H  $g(x) = 16x - 8$

G  $g(x) = x + 2$       J  $g(x) = 16x + 8$

29. Which of these is the parent function?

$3\sqrt{x-1} + 5$

A  $x^3$       C  $x$

B  $\sqrt{x}$       D  $x - 1$

30. If  $f(x) = -x^3 + 2x^2 - 3x + 4$ , and  $g(x)$  is a translation of  $f(x)$  two units to the right, which of the following is equal to  $g(x)$ ?

F  $-x^3 - 4x^2 - 23x + 26$

G  $-x^3 - 4x^2 - 7x - 2$

H  $-x^3 + 8x^2 - 23x + 26$

J  $-x^3 + 8x^2 - 7x - 2$

31. What are the domain and range of the inverse of  $y = \frac{1}{x^2} + 1$ ?

A D:  $\mathbb{R}$ ; R:  $y \neq 0$       C D:  $x \neq 0$ ; R:  $y > 1$

B D:  $x \neq 0$ ; R:  $\mathbb{R}$       D D:  $x > 1$ ; R:  $y \neq 0$

32. Henry throws a tennis ball over his house. The ball is 6 feet above the ground when he lets it go. The quadratic equation that models the path of the ball is  $p(x) = -16t^2 + 46t + 6$ . How long does it take for the ball to hit the ground?

F 2 seconds      H 4.5 seconds

G 3 seconds      J 6 seconds

33. Which linear equation best fits this data set?

<b>x</b>	1	4	6	8	11
<b>y</b>	2	3	6	5	8

A  $y = \frac{3}{5}x + \frac{5}{4}$       C  $y = x + 1$

B  $y = \frac{2}{3}x + \frac{5}{2}$       D  $y = \frac{4}{3}x - \frac{1}{2}$

34. Use constant differences or ratios to determine which parent function would best model the given data set.

<b>x</b>	0	3	8	15	24	35
<b>y</b>	2	4	6	8	10	12

F exponential      H quadratic

G linear      J square root

# Answers

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## END-OF-COURSE TEST

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1. B
2. G
3. D
4. F
5. B
6. J
7. A
8. F
9. B
10. F
11. A
12. J
13. C
14. H
15. A
16. F
17. B
18. J
19. C
20. J
21. A
22. F
23. A
24. F
25. C
26. G
27. C
28. H
29. B
30. H
31. C
32. G
33. A
34. J