

Directions: Choose the letter that corresponds to the correct answer.

1. A scuba diver descends 80 feet, rises 25 feet, descends 12 feet, and then rises 52 feet where he will do a safety stop for five minutes before surfacing. At what depth did he do his safety stop?

- A. -15
- B. -14
- C. 16
- D. 14

2. Evaluate the algebraic expression $y\left\{\left(\frac{x}{2} - 3\right) - 4a\right\}$ when

$$a = 3$$

$$x = 6$$

$$y = \frac{1}{2}$$

- A. $y\left\{\left(\frac{x}{2} - 3\right) - 4a\right\} = -5$
- B. $y\left\{\left(\frac{x}{2} - 3\right) - 4a\right\} = -7$
- C. $y\left\{\left(\frac{x}{2} - 3\right) - 4a\right\} = 5$
- D. $y\left\{\left(\frac{x}{2} - 3\right) - 4a\right\} = -6$

3. If x is an even integer and y is an odd integer, which of the following must be an odd integer?

- A. $2x + 2y$
- B. $2x - 2y$
- C. $x + y + 1$
- D. $x + y + 2$

4. 35% of 15% of x is equivalent to which of the following?

- A. $0.0525x$
- B. $0.125x$
- C. $0.25x$
- D. $0.525x$

5. If 60% of a number is 12, what is 165% of the same number?

- A. 30
- B. 31
- C. 32
- D. 33

6. Solve the inequality $\frac{4}{3}x - 5 > x - 2$.

- A. $x > 3$
- B. $x > 6$
- C. $x > 9$
- D. $x > 12$

7. Solve this quadratic equation: $24x^2 = 3(43x - 15)$.

- A. $x = \frac{1}{3}$ and $x = 6$
- B. $x = \frac{2}{8}$ and $x = -5$
- C. $x = 3$ and $x = \frac{1}{8}$
- D. $x = \frac{3}{8}$ and $x = 5$

8. The inequality corresponding to the statement: "the price is no less than 100 Dollars" is

- A. $x < 100$
- B. $x \geq 100$
- C. $x \leq 100$
- D. $x > 100$

9. Which of these points **DOES NOT** lie on the graph of $y = -x + 3$?

- A. (9, -6)
- B. (3, 0)
- C. (-2, 5)
- D. (2, 2)

10. Which of these relations **DOES NOT** represent a function?

- A. $\{(2,3),(-4,3),(7,3)\}$
- B. $\{(0,0),(-1,-1),(2,2)\}$
- C. $\{(2,3),(-5,3),(2,7)\}$
- D. $\{(-1,3),(-5,3),(-9,0)\}$

11. Which property is used to write: $3(x y) = (3 x)y$?
- A. Commutative property of multiplication B. Multiplicative inverse property
C. Distributive property D. Associative property of multiplication
12. Which of these values of x satisfies the inequality $-7x + 6 \leq -8$
- A. -2 B. 0 C. -7 D. 2
13. The equation $|-2x - 5| - 3 = k$ has no solution if $k =$
- A. -5 B. -3 C. 7 D. 0
14. If $x > 0$, which of the following must always be true?
- I. $\sqrt{x} < x$ II. $x^2 > x$ III. $x^2 > \sqrt{x}$
- A. I only
B. II only
C. III only
D. none of these
15. Find the value of k such that the quadratic equation $4x^2 + 7x + 3 = 2k$ have equal roots.
- A. $\frac{3}{16}$
B. $-\frac{5}{11}$
C. $\frac{2}{27}$
D. $-\frac{1}{32}$
16. What is the slope of the line containing (0,1) and (6,8)?
- A. $\frac{7}{6}$
B. $\frac{6}{7}$
C. $\frac{1}{2}$

D. 2

17. If $a = 3c - 4$ and $b = 2(3 - c)$ what is $3b$ expressed in terms of a ?

- A. $10 - 2a$
- B. $5 - 2a$
- C. $10 - a$
- D. $5 - a$

18. Which of the following cannot yield an odd integer when divided by 10?

- A. The sum of two odd integers.
- B. The product of two prime numbers.
- C. The product of two odd integers.
- D. The sum of three consecutive integers.

19. The value of $2^{-|2|}$ is

- A. 4
- B. 0.25
- C. -4
- D. -0.25

20. If $f(x) = 4x^3 - 4x^2 + 10$, then $f(-2) =$

- A. 26
- B. -38
- C. 10
- D. 38

21. In which quadrant do the lines $x = 3$ and $y = -4$ intersect?

- A. I
- B. II
- C. III
- D. IV

22. Solve the inequality $3(1 - 3x) \geq -3(x + 27)$

- A. $3 \geq x$
- B. 7
- C. $14x$
- D. $14 \geq x$

23. Simplify the equation $(3xy^5)^2 - 11x^2y^2(4y^4)^2$

- A. $176x^2y^{10}$
- B. $-176x^2y^{10}$
- C. $-167x^2y^{10}$
- D. $167x^2y^{10}$

24. Factor the following polynomial: $v^4 - 13v^2 - 48$

- A. $v^4 - 13v^2 - 48 = (v^2 + 3)(v + 4)(v - 4)$
- B. $v^4 + 13v^2 - 48 = (v^2 + 3)(v + 4)(v - 4)$.
- C. $(v + 4) = v^2 - 4v + 4v - 16 = v^2 - 16$
- D. $(v - 4) = v^2 - 4v + 4v - 16 = v^2 - 16$

25. Simplify the following radical expression: $(9\sqrt{a^2b})(3a\sqrt{b})$

- A. $18ab^2$
- B. $9ab$
- C. a^2b
- D. $27a^2b$

26. Which of the following describes the values of x for which $16 - x^2 \geq 0$?

- A. $x \leq -4$ or $x \geq 4$
- B. $-4 \leq x \leq 4$
- C. $0 \leq x \leq 4$
- D. $x \geq 0$

27. If $16x + 8y$ represents the perimeter of a rectangle, and $5x - 2y$ represents its width, then its length is represented by the expression

- A. $3x + 2y$
- B. $3x + 6y$
- C. $11x + 6y$
- D. $21x + 6y$

28. Find the values of k for which the equation $\frac{x^2}{k} - kx + k = 0$ has two real roots.

- A. $k = 2$

- B. $-2 < k < 2$
- C. $k < -2$ or $k > 2$
- D. $-2 \leq k \leq 2$

29. A company's profits increased by 12% from 2010 to 2011 and by 18% from 2011 to 2012. By what percent did the company's profits increase from 2010 to 2012?

- A. 37%
- B. 54%
- C. 12%
- D. 32%

30. Solve for x : $9^{2x+5} = 81^{x+1}$

- A. -4
- B. 4
- C. 1
- D. no solution

31. What is the average of the solution set of the inequality $|-2x + 4| < 6$?

- A. -2
- B. -3
- C. 2
- D. 3

32. A number, x , is decreased by 40% then increased by 25%. What is the final result in terms of x ?

- A. $0.55x$
- B. $0.65x$
- C. $0.7x$
- D. $0.75x$

33. The expression $(x + y)[z - (x - y)]$ is equivalent to which of the following?

- A. $xz - x^2 + 2xy + y^2$

B. $xz - x^2 + yz + y^2$

C. $xyz + y^2 - xy + yz + y^2$

D. $xz + x^2 - yz - y^2$

34. If $x + y = 7$ and $x - y = 3$, what is $x^2 - y^2 = ?$

A. 4

B. 21

C. 25

D. 36

35. If $f(x) = x^2 + 2x + 2$, what is $f(x + h)$?

A. $x^2 + 2x + 2xh + 2h + h^2 + 2$

B. $2x^2 + 4hx + h^2 - 2x - 2h$

C. $x + h^2 + 2xh + 2 + h$

D. $x^2 + 4xh + 4h^2 + 2x$

36. What is the sum of the x and y coordinates of the midpoint between the points $(-2, 9)$ and $(10, -4)$?

A. 3.5

B. 5

C. 6.5

D. 7.5

37. A company will be using a pie chart to represent the total expenditures of its various departments. If the breakdown of its expenditures is as follows: 19% Research and Development, 33% Marketing, 22% Payroll. If the remaining expenditures represent \$12,250, what is the dollar amount spent on Research and Development (Round to nearest unit)?

A. 8952

B. 7488

C. 8289

D. 5690

38. Solve for x : $\log 16^x = \log_8 1$

- A. 0
- B. 3
- C. 16
- D. 20

39. What are the x-intercepts of the function $f(x) = x^3 + 3x^2 - x - 3$?

- A. -3, -1, 1
- B. -3, 0, 1
- C. 0, 3
- D. -3, 0

40. Give the simplest form of $\frac{\tan^2\theta - \sin^2\theta}{\tan^2\theta \sin^2\theta}$

- A. 0
- B. 1
- C. -1
- D. $\tan \theta$

41. If $a = -1$ and $b = 4$, what is the difference between $a^3b + 3b$ and $a^3b + 3b^0$?

- A. 5
- B. -3
- C. 9
- D. 6

42. $4xyz \cdot 2x^2y^2 \cdot \frac{1}{3}z^3 \cdot \frac{1}{4}y^2 \cdot z$

The equation above is equivalent to which of the following?

- A. $\frac{1}{3}xy^3z^3$
- B. $\frac{2}{3}x^3y^5z^5$
- C. $\frac{3}{3}x^2y^2z^2$
- D. $\frac{3}{4}x^4y^2z^2$

43. What is the solution set of $|2(x - 1) - 15| = 7$?

- A. { 5 }
- B. { 12 }
- C. { 5, 12 }
- D. { -5, 12 }

44. Which of these is true for all real numbers x and y such that $x > 0$ and $y < 0$?

- A. $xy > 0$
- B. $x + y > 0$
- C. $x^2 + y^2 > 0$
- D. $x - y < 0$

45. The chart below shows the monthly profits of 3 companies. What is the total profit generated by Store X and Store Z in the month of March?



- A. 120,000
- B. 140,000
- C. 180,000



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Set 1

D. 200,000

46. If $h(x) = 3x + 4$, what is $h(2x - 3)$?

- A. $-6X + 5$
- B. $6X - 5$
- C. $5X - 2$
- D. $5X + 2$

47. If $-1 < a < b < 0$, then which of the following has the greatest value?

- A. $b - a$
- B. $a + b$
- C. $a - b$
- D. $2b - a$



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To God be the glory!