

1. Factor $x^{2a} - 3x^a - 4$.

- A. $(ax - 4)(ax + 1)$ B. $(x^a + 1)(x^a - 4)$ C. $(x^a - 2)(x^a + 2)$
D. $(x^2 + 1)(x^a - 4)$ E. Not Given

2. For any x , $|x - 4| =$

- A. $x - 4$ B. $|x + 4|$ C. $|4 - x|$ D. $-x - 4$ E. Not Given.

3. $\log_8 64 =$

- A. 8 B. 2 C. $\frac{1}{2}$ D. $\frac{1}{2}$ E. Not Given

4. Simplify $\frac{6+\sqrt{3}}{6-\sqrt{3}} =$

- A. -1 B. $\frac{16+2\sqrt{3}}{9}$ C. $36 - 2\sqrt{3}$ D. $\frac{13+4\sqrt{3}}{11}$ E. Not Given.

5. If the sum of five consecutive odd integers is 85, what is the smallest of the integers?

- A. 21 B. 17 C. 13 D. 19 E. Not Given

6. Simplify $8x^3 - \{7x^2 - 6[x^2 - 5x(x^2 - x)] + 4x^3\}$

- A. $-26x^3 + 29x^2$ B. $4x^3 + 9x^2$ C. $4x^3 - 13x^2$ D. $x^3 + 5x^2$ E. Not Given

7. In the equation $x^2 - 7x + 2 = 0$, the sum of the roots exceeds the product of the roots by

- A. 9 B. 5 C. -5 D. -9 E. Not Given

8. Find the value of x in the solution.
$$\begin{cases} 3x = -y + 44 \\ 5x = 4y + 28 \end{cases}$$

- A. 8 B. 12 C. 4 D. 9 E. Not Given

9. Simplify $\frac{12!}{8!4!}$.

- A. 2970 B. 495 C. 1 D. $\frac{3}{8}$ E. Not Given

10. Combine $\frac{x}{2x+4} - \frac{2}{x^2+3x+2}$.

- A. $\frac{x^2+2x+24}{2(x+2)(x+1)}$ B. $\frac{1}{(x+1)}$ C. $\frac{x-2}{-2x}$ D. $\frac{x-4}{2(x+1)(x+2)}$ E. Not Given

11. Given $a\Delta b = 3a^2 - 2b$, what is the value of $(3\Delta 2)\Delta 1$?

- A. 23 B. 106 C. 527 D. 1585 E. Not Given

12. Successive discounts of 20% and 10% are equivalent to a single discount of

- A. 30% B. 15% C. 25% D. 28% E. Not Given

13. $-3|x| + |-x| =$

- A. -3 B. $2|x|$ C. $-2|x|$ D. $3|x|$ E. Not Given

14. The equality $5^3 = 125$ can be written as

- A. $\log_3 125 = 5$ B. $\log_5 125 = 3$ C. $\log_3 5 = 125$ D. $\log_5 3 = 125$ E. Not Given.

15. Simplify $81^{3/4}$

- A. 27 B. $60\frac{3}{4}$ C. 9 D. $3\sqrt[4]{9}$ E. Not Given

16. If $x < 2$, simplify $|x - 2| - 4|-6|$

- A. $x - 22$ B. $-x - 22$ C. $x - 26$ D. $x - 12$ E. Not Given

17. Simplify $\frac{12r^3s^3t^4}{56r^7s^5t^2}$

- A. $\frac{3t^8}{14r^{14}s^{15}}$ B. $\frac{2r^3s^2}{3t^2}$ C. $\frac{2t^2}{7r^3s^3}$ D. $\frac{3t^2}{14s^2}$ E. Not Given

18. Find the coefficient for x^3y^4 in the expansion of $(4x - 2y)^7$.

- A. 35,840 B. 35 C. 1024 D. -71680 E. Not Given

19. Solve $-x^2 - x + 6 \leq 0$

- A. $(-\infty, -3) \cup (2, \infty)$ B. $(-\infty, -3] \cup [2, \infty)$ C. $(-\infty, -2] \cup [3, \infty)$ D. $(-\infty, -2) \cup (3, \infty)$ E. Not Given

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

- A. -3 B. $3\frac{1}{2}$ C. $-\frac{13}{6}$ D. No Solution E. Not Given

21. Factor completely $6x - x^3 - x^2$

- A. $x(x - 2)(x + 3)$ B. $x(x - 3)(x + 2)$ C. $-x(x - 3)(x + 2)$
D. $-x(x - 2)(x + 3)$ E. Not Given

22. Solve $(4x + 3)^3 = -8$

- A. $-\frac{5}{4}$ B. $\frac{4}{5}$ C. $\frac{5}{4}$ D. 0 E. Not Given

23. Solve $2^{x-1} \cdot 3^{x-1} = 216$

- A. $\ln 216$ B. 4 C. $\sqrt{\frac{3}{2}}$ D. 2 E. Not Given

24. $(x + y) + z = z + (x + y)$ is an example of the _____ property of addition.

- A. Commutative B. Associative C. Distributive D. Identity E. Not Given

25. In the following system what does $z = ?$ $\begin{cases} x + 3y - z = -6 \\ 2x + 3y + 2z = 11 \\ -3x + 4y - 2z = -20 \end{cases}$

- A. -1 B. -2 C. 2 D. 5 E. Not Given

26. Determine the length of the line segment with endpoints (4, -3) and (-1, 10).

- A. 10 B. $\sqrt{194}$ C. $\sqrt{206}$ D. $\sqrt{58}$ E. Not Given

27. Let $f(x) = 1 - x^2$ and $g(x) = 2x + 1$. Find $(f \circ g)(x)$.

- A. $-2x^2 + 3$ B. $-4x^2 + 4x + 2$ C. $-4x^2 + 2$ D. $-4x^2 - 4x$ E. Not Given

28. Simplify i^{641}

- A. 1 B. i C. -1 D. $-i$ E. Not Given

29. Determine the equation of the horizontal asymptote of the graph $F(x) = \frac{x^4 - 6x^3 + 7x^2 - 2}{x^4 - 4x^2 + 1}$

- A. $y = 1$ B. $y = 0$ C. $y = \frac{4}{3}$ D. $y = -2$ E. Not Given

30. The sequence 4, 6, 9, 13, 20, 25, ... is:

- A. An Arithmetic Sequence B. A Geometric Sequence C. The Fibonacci Sequence
D. The Binomial Sequence E. Not Given

31. Find the product $\begin{bmatrix} 8 & -1 \\ 7 & -4 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} 11 & 2 \\ 0 & -1 \end{bmatrix}$

- A. $\begin{bmatrix} 88 & 35 & -6 \\ 0 & -12 & 0 \end{bmatrix}$ B. $\begin{bmatrix} 88 & -33 \\ 43 & -15 \\ 15 & -6 \end{bmatrix}$ C. $\begin{bmatrix} 88 & 17 \\ 77 & 18 \\ -33 & -6 \end{bmatrix}$
D. $\begin{bmatrix} 88 & 43 & 15 \\ -33 & -15 & -6 \end{bmatrix}$ E. Not Given

32. Solve for x : $\ln(2x - 9) = 0$

- A. 4 B. 2 C. 5 D. 3 E. Not Given

33. Find all solutions for x : $x^3 - 3x^2 + 4x = 12$.

- A. $x = 2, \pm 3i$ B. $x = -2, \pm 3i$ C. $x = 3, \pm 2i$ D. $x = -3, \pm 2i$ E. Not Given

34. Solve for $\sqrt{x+5} < 2$.

- A. $(-\infty, -1)$ B. $(-\infty, \infty)$ C. $(-5, -1)$ D. $(-1, -5)$ E. Not Given

35. The distance between points A and B is 10 units. If point A is located at $(4, -2)$ and B is located at $(12, x)$, what are the possible values of x ?

- A. -8, 4 B. 8, -4 C. -12, 8 D. 12, -8 E. Not Given

36. Line R passes through points $(3, 8)$ and $(3, 13)$. Find the slope of the line perpendicular to line R.

- A. 5 B. $\frac{1}{5}$ C. 0 D. Undefined E. Not Given

37. A pole 17.3 meters high casts a shadow 9.6 meters long at the same time that a tree casts a shadow 6.4 meters long. Find the height of the tree to the nearest tenth of a meter.

- A. 3.6 B. 11.5 C. 25.9 D. 16 E. Not given

38. A batter hits a softball when it is 3 feet off the ground. After it is hit, the height h (in feet) of the ball at time t (in seconds) is given by $h = -16t^2 + 80t + 3$. The maximum height reached by the ball is

- A. 103 feet B. 80 feet C. 135 feet D. 204 feet E. Not Given

39. How many different ways can a committee of 4 be chosen from a group of 8 people?

A. 40320

B. 1680

C. 70

D. 4

E. Not Given

40. The length of a rectangular garden is 3 yards more than its width. If the area of the garden is 36 square yards, which equation could be used to find the dimensions of the garden?

A. $x^2 + 3x + 36 = 0$

B. $x^2 - 3x + 36 = 0$

C. $x^2 + 3x - 36 = 0$

D. $3x^2 + x - 36 = 0$

E. Not Given

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ALGEBRA TEAM TEST ANSWERS

1. B
2. C
3. B
4. D
5. C
6. A
7. B
8. B
9. B
10. D
11. D
12. D
13. C
14. B
15. A
16. B
17. E
18. A
19. B
20. A
21. D
22. A
23. B
24. A
25. D
26. B
27. D
28. B
29. A
30. B
31. C
32. C
33. C
34. A
35. A
36. C
37. B
38. A
39. C
40. C