

LEVEL 1 (ALGEBRA I) BLITZ 2004

1. $\sqrt{(-2)^2}$

- a) 2 b) $\sqrt{2}$ c) $-\sqrt{2}$ d) -2 e) none of these

The expression $12 \div 2 - 4 \times 5 =$ is equivalent to

- a) -14 b) 10 c) 12 d) -30 e) none of these

3. $\sqrt{x^2}$

- a) x b) $-x$ c) $|x|$ d) $-|x|$ e) none of these

4. If we use the method of completing the square to solve the equation $2x^2 + 6x - 1 = 0$ which of the following is going to give you the correct answer?

- a) $(x + \frac{3}{2})^2 = \frac{11}{4}$ b) $(x + 3)^2 = 1$ c) $(x + \frac{3}{2})^2 = \frac{1}{2}$
d) $(x + 3)^2 = \frac{11}{4}$ e) none of these

5. Simplify $\frac{-2^2(3^2 - 2) - 10(3 - 2^2)}{-3^2 - (-1)}$, the answer is

- a) $\frac{19}{5}$ b) $-\frac{9}{5}$ c) $\frac{9}{5}$ d) $-\frac{19}{5}$ e) none of these

6. The graph of $y = 2x^2 - 4x + 3$ has y-intercept at $y =$

- a) 0 b) 3 c) -3 d) 1 e) none of these

7. The graph of $y = 3x^2 - 2x + 1$ has vertex point

- a) $(0,1)$ b) $(1,2)$ c) $(\frac{1}{3}, \frac{2}{3})$ d) $(-\frac{1}{3}, \frac{2}{3})$ e) none of these

8. The solution of the inequality $x - 3 > 2x - 1$ is

- a) $x > -2$ b) $x > 2$ c) $x < -2$ d) $x < 2$ e) none of these

9. Simplify the expression $\frac{x^{-1} + y^{-1}}{x^{-1} - y^{-1}} =$

- a) $\frac{x+y}{x-y}$ b) $\frac{x+y}{y-x}$ c) -1 d) 1 e) none of these

10. If $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$ then R is equal to

- a) $R_1 + R_2$ b) $R_1 - R_2$ c) $\frac{R_1 + R_2}{R_1 R_2}$ d) $\frac{R_1 R_2}{R_1 + R_2}$ e) none of these

11. The distance between the two points (2, 1) and (-2, 3) is:

- a) 6 b) 2 c) $2\sqrt{5}$ d) $\sqrt{6}$ e) none of these

12. The line that passes through the point (-2, -3) and is parallel to the line $y = 2x - 3$ has equation

- a) $y = 2x + 1$ b) $y - 3 = 2(x - 2)$ c) $y = -\frac{1}{2}x - 2$
d) $y = 2x - 1$ e) none of these

13. $\sqrt{x+3}$ is defined to be real for

- a) $x \geq 3$ b) $x \leq 3$ c) $x \geq -3$ d) $x \leq -3$ e) none of these

14. The graphs of $x - 2y = 6$, $x = 0$, $2x + 3y = -9$, and $y = -3$ intersect at:

- a) no point b) (2, 1) c) (0, -3) d) (3, 1) e) none of these

15. Simplify the expression $\left(\frac{x^{-3}y^{-2}z^{-1}}{x^{-1}y^{-3}z}\right)^{-2}$

- a) $\frac{x^4z^4}{y^2}$ b) $\frac{y^2}{x^4z^4}$ c) $\frac{x^2y}{z}$ d) $x^6y^8z^4$ e) none of these

16. The number $\pi =$

- a) 3.14 b) $\frac{22}{7}$ c) 3.1415 d) 3.1416 e) none of these

17. The solution of $2.5x - 3 = x + 1.2$ is
 a) $14/5$ b) $6/5$ c) 2.5 d) 1.5 e) none of these
18. If $2x + 3y = 5$ and $x - 2y = 2$, then $x - y =$
 a) -1 b) $1/7$ c) $15/7$ d) 7 e) none of these
19. If $f(x) = x^2 + x - 1$ then $f(x-1) =$
 a) $x^2 + x - 2$ b) $x^2 - 1$ c) $x^2 + 3x - 3$ d) $x^2 - x -$
 e) none of these
20. Simplify the rational expression $\frac{3xy^2 - xy - x^2y + 3x^2y^2}{3y - 1}$
 a) $xy + 3x^2y^2$ b) $xy(1+x)$ c) x^2y d) xy
 e) none of these
21. If $A = P + PRT$ then $P =$
 a) $\frac{A}{RT} - 1$ b) $\frac{A - P}{RT}$ c) $\frac{A}{1 + RT}$ d) $\frac{A}{1 - RT}$ e) none of these
22. Rationalize the denominator: $\frac{1}{1 + \sqrt{3}}$
 a) $\frac{\sqrt{3} - 1}{2}$ b) $\frac{1 + \sqrt{3}}{2}$ c) $\frac{1 - \sqrt{3}}{2}$ d) $\frac{\sqrt{3}}{2}$ e) none of these
23. The solution of the equation $\frac{1}{x+2} = \frac{1}{2x+1}$ is $x =$
 a) 2 b) 1 c) 2 d) 3 e) none of these
24. Solve for x : $\frac{x+2}{-3} \geq 0$
 a) $x \geq 2$ b) $x \leq 2$ c) $x \leq -2$ d) $x \geq -2$ e) none of these
25. Express the product $(3 \times 10^5)(4.1 \times 10^4)$ in scientific notation.
 a) 5.1×10^9 b) 12.3×10^9 c) 7.1×10^9 d) 1.23×10^{10}
 e) none of these
26. Solve the equation: $|x| + 2 = 1$
 a) $x=1$ b) $x=-1$ c) $x=-2$ d) no solution e) none of these

27. Simplify: $\sqrt{2x^3y}\sqrt{2xy}$. Assume $x > 0$ and $y > 0$.
- a) $2xy$ b) $2x^2y$ c) $2xy\sqrt{x}$ d) $4xy$ e) none of these
28. A computer game was sold for \$45. After a 20% discount and then a 20% increase, what is the new price?
- a) \$45 b) \$43.80 c) \$43.50 d) \$43.20 e) none of these
29. $|\sqrt{2}-2| =$
- a) $\sqrt{2}-2$ b) $2-\sqrt{2}$ c) $\sqrt{2}+1$ d) $\sqrt{2}-1$ e) none of these
30. If $x(x+1) = 12$, then $x =$
- a) 3,4 b) -3,-4 c) 3,-4 d) 4,-3 e) none of these
31. The slope of the line $2y + 3x = 7$ is
- a) $-\frac{3}{2}$ b) $\frac{3}{2}$ c) 3 d) -3 e) none of these
32. The expression $3\sqrt{8} - 6\sqrt{72}$ is equivalent to:
- a) 0 b) -30 c) $-30\sqrt{2}$ d) -30 e) none of these
33. The remainder when $2x^3 + 3x^2 - 4x - 1$ is divided by $x - 1$ is
- a) -1 b) 0 c) 1 d) 2 e) none of these
34. If a larger water pipe can fill a tank in 4 hours and a smaller pipe can fill the tank in 5 hours, approximately how long will it take the two pipes fill the tank together?
- a) 4.5 hr b) 3 hr c) 2.22 hr d) 4 hr e) none of these
35. $(x - 2y)^2 =$
- a) $x^2 - 4y^2$ b) $x^2 + 4y^2$ c) $x^2 - 2xy + 4y^2$ d) $x^2 - 4xy + 4y^2$
e) none of these
36. If $x \neq 5$, then $\frac{3x}{x-5} - \frac{2x-25}{5-x} =$
- a) 5 b) -5 c) $\frac{2x-25}{x-5}$ d) $\frac{2x+25}{x-5}$ e) none of these

37. $\frac{r^2 + rs - 12s^2}{r^2 - rs - 20s^2} \div \frac{r^2 - 2rs - 3s^2}{r^2 + rs - 30s^2} =$
- a) $\frac{r+6s}{r+s}$ b) $\frac{r+s}{r-s}$ c) $\frac{(r-3s)^2}{(r+6s)}$ d) $\frac{r-s}{r+s}$
 e) none of these
38. Biologists tagged 250 fish in Gun Lake Michigan, and later they found 7 tagged fish in a sample of 350. The number of fish in the lake in the nearest hundred is:
 a) 12,500 b) 12,200 c) 13,400 d) 12,600 e) none of these
39. How many liters of a 60% acid solution must be mixed with a 75% acid solution to get 20 liters of a 72% solution?
 a) 3 liters b) 4 liters c) 5 liters d) 5.5 liters e) none of these
40. $-2^2[2 - 3(2 - 1^2)] - (3^2 + 2)(1 - 2^2) =$
 a) 170 b) 58 c) 37 d) -35 e) none of these
41. $(a - 2)(a^2 + 2a + 4) =$
 a) $a^3 - 8$ b) $a^3 - 2a - 8$ c) $a^3 + 8$ d) $a^3 + 2a$ e) none of these
42. $\frac{3 \times 10^{-14} + 5 \times 10^{-14}}{(2 \times 10^{-3})(2 \times 10^{-11})} =$
 a) 2×10^{-2} b) 1 c) 1.5 d) 2 e) none of these
43. If $x = -2$ and $y = 3$, then the value of $\frac{x-y}{2} - \frac{x^2y}{3}$ is:
 a) $-\frac{13}{2}$ b) -2 c) $-1\frac{1}{2}$ d) $\frac{1}{2}$ e) none of these
44. Solve the rational equation $\frac{3}{x} - \frac{2}{x-20} =$
 a) $x = 5$ b) $x = -5$ c) no solution d) $x = \pm 5$ e) none of these
45. The number of solutions of the system $\begin{cases} -2x + 3y = 12 + 2y \\ 2x - 5y + 4 = -8 - 4y \end{cases}$ is
 a) 0 b) 1 c) 2 d) infinite e) none of these