

Algebra Assessment

**Number of questions: 50
Time: 60 minutes**

1. The value of B in the equation $A = \left(\frac{h}{2}\right)(B + b)$ is:

- A. $(2A - b)h$
- B. $2h/A - b$
- C. $2A - b$
- D. $2A/h - b$
- E. None of the above

2. Which of the following integers is the square of an integer for every integer x ?

- A. $x^2 + x$
- B. $x^2 + 1$
- C. $x^2 + 2x$
- D. $x^2 + 2x - 4$
- E. $x^2 + 2x + 1$

3. Each of the integers h, m and n is divisible by 3. Which of the following integers is ALWAYS divisible by 9?

- I hm
 - II $h + m$
 - III $h + m + n$
- A. I only
 - B. II only
 - C. III only
 - D. II and III only
 - E. I, II and III

4. What is the factorization of $x^2 + ax - 2x - 2a$?

- A. $(x + 2)(x - a)$
- B. $(x - 2)(x + a)$
- C. $(x + 2)(x + a)$
- D. $(x - 2)(x - a)$
- E. None of the above

5. What is the value of x in the equation

$$\sqrt{5x - 4} - 5 = -1?$$

- A. 2
- B. 5
- C. No value
- D. 4
- E. -4

6. The number missing in the series, 1, 2, 3, 5, x , 13, 21 is

- A. 36
- B. 24
- C. 8
- D. 38
- E. 40

7. How many real solutions does each quadratic equation $x^2 - 7x + 10 = 0$ have?

- A. 0
- B. 1
- C. 2
- D. None of these
- E. cannot be determined

8. $1 + \frac{y}{x-2y} - \frac{y}{x+2y} =$

- A. 0
- B. 1
- C. $\frac{1}{(x-2y)(x+2y)}$
- D. $\frac{2x-y}{(x-2y)(x+2y)}$
- E. $\frac{x^2}{(x-2y)(x+2y)}$

9. If $0 < a < 1$ and $b > 1$, which is the largest value?

- A. a/b
- B. b/a
- C. $(a/b)^2$
- D. $(b/a)^2$
- E. Cannot be determined

10. Given $\frac{(\alpha+x)+y}{x+y} = \frac{\beta+y}{y}$, $\frac{x}{y} = ?$

- A. α/β
- B. β/α
- C. $\beta/\alpha - 1$
- D. $\alpha/\beta - 1$
- E. 1

11. If n is an integer, which of the following represents an odd number?

- A. $2n+3$
- B. $2n$
- C. $2n+2$
- D. $3n$
- E. $n+1$

12. Which of the following statements are true, if

$$x + y + z = 10$$

$$y \geq 5$$

$$4 \geq z \geq 3$$

- I. $x < z$
 - II. $x > y$
 - III. $x + z \leq y$
- A. I only
 - B. II only
 - C. III only
 - D. I and III
 - E. I, II and III

13. Jenny buys a calculator for \$ 720 and sells it at a loss of $(\frac{6^2}{3})\%$. For how much does she sell it?
- 672
 - 720
 - 762
 - 482
 - None of these
14. If $v = \pi b^2(r - \frac{b}{3})$, then r is equal to
- $\frac{v}{\pi b^2} + \frac{b}{3}$
 - $\frac{v}{\pi b^2} + \frac{b}{3\pi}$
 - $\frac{v}{\pi b^2} + 3b$
 - $v + \frac{b}{3}$
 - $v + \frac{\pi b}{3}$
15. If $\frac{a}{x} - \frac{b}{y} = c$ and $xy = \frac{1}{c}$, then $bx = ?$
- $1 - ay$
 - ay
 - $ay + 1$
 - $ay - 1$
 - $2ay$
16. If $z = x^a, y = x^b$ then $z^b y^a = ?$
- $x^{(ab)^2}$
 - x^{ab}
 - x^0
 - x^{2ab}
 - x
17. The mean (average) of the numbers 50, 60, 65, 75, x and y is 65. What is the mean of x and y ?
- 67
 - 70
 - 71
 - 73
 - 75
18. If x and 10 are relatively prime natural numbers, then x could be a multiple of
- 9
 - 18
 - 4
 - 25
 - 14

19. A first square has a side of length x while the length of a side of a second square is two units greater than the length of a side of the first square. What is an expression for the areas of the squares?

- A. $2x^2 + 4x + 4$
- B. $x^2 + 2$
- C. $x^2 + 4$
- D. $2x^2 + 2x + 2$
- E. $2x^2 + 3x + 4$

20. In 16 years, Ben will be 3 times as old as he is right now. How old is he right now?

- A. 10
- B. 9
- C. 8
- D. 11
- E. none of these

21. If $x - y = 9$ then $3x - 3y - 1 =$

- A. 23
- B. 24
- C. 25
- D. 26
- E. 28

22. $4^{x-3} = (\sqrt{2})^x$ The value of x is

- A. 0
- B. 5
- C. 4
- D. $\frac{1}{2}$
- E. 3

23. Find the first term of the arithmetic progression whose third term a_3 is 7 and whose eighth term a_8 is 17.

- A. 0
- B. 2
- C. 3
- D. 1
- E. 4

24. If $x = -2y$ and $2x - 6y = 5$ then $\frac{1}{x} + \frac{1}{y} =$

- A. $\frac{3}{2}$
- B. -3
- C. -1
- D. $-\frac{3}{2}$
- E. 3

25. If $f(x) = 2x - 5$ then $f(x + h) =$

- A. $2x + h - 5$
- B. $2h - 5$
- C. $2x + 2h - 5$
- D. $2x - 2h + 5$

E. $2x - 5$

26. If $a + b = 3$ and $2b + c = 2$, then $2a - c =$

- A. -4
- B. -1
- C. 1
- D. 4
- E. 5

27. If $x > \frac{1}{5}$, then

- A. x is greater than 1.
- B. x is greater than 5.
- C. $\frac{1}{x}$ is greater than 5.
- D. $\frac{1}{x}$ is less than 5.
- E. None of the above statements is true.

28. If $f(x) = x^2 + 3x + 2$, then $[f(x+a) - f(x)]/a =$

- A. $2x + a + 3$
- B. $(x+a)^2 - x^2$
- C. only if $x > 0$.
- D. only if $x < 0$.
- E. always

29. The present ages of Deklerk and Saniya are in the ratio 3:4. Five years from now, the ratio of their ages will be 4:5. Find their present ages respectively.

- A. 20,15
- B. 15,20
- C. 18,15
- D. 15,18
- E. 12,20

30. If $x + y = 8$ and $xy = 6$, then $\frac{1}{x} + \frac{1}{y} =$

- A. $\frac{1}{8}$
- B. $\frac{1}{6}$
- C. $\frac{1}{4}$
- D. $\frac{4}{3}$
- E. 8

31. If $x^{64} = 64$ then $x^{32} =$

- A. 8 or -8
- B. 12 or -12
- C. 16
- D. 32 or -32
- E. 48

32. If $\sqrt{x-1} = 2$ then $(x-1)^2 =$

- A. 4
- B. 6
- C. 8
- D. 10
- E. 16

33. There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of Rs. 12,000 after 3 years at the same rate?

- A. RS 2160
- B. Rs 3120
- C. Rs 3972
- D. Rs 6240
- E. None of these

34. If $2^{(6x-8)} = 16$ then $x =$

- A. 2
- B. 4
- C. 10
- D. 1
- E. 6

35. Aaron alone can finish a piece of work in 12 days and Brandon alone can do it in 15 days. If both of them work at it together, how much time will they take to finish it?

- A. $6\frac{2}{3}$ days
- B. $5\frac{2}{3}$ days
- C. $4\frac{2}{3}$ days
- D. $7\frac{2}{3}$ days
- E. $8\frac{2}{3}$ days

36. $\sqrt{X\sqrt{X\sqrt{X^2}}} = ?$

- A. X
- B. $X^{7/4}$
- C. $X^{15/16}$
- D. $X^{3/4}$
- E. $X^{15/8}$

37. When Ashish increases his speed from 20 Km/hr to 25 Km/hr, he takes one hour less than the usual time to cover a certain distance. What is the distance usually covered by him?

- A. 125 Km
- B. 100 Km
- C. 80 Km
- D. 120 Km
- E. 110 Km

38. If x and y are two different real numbers and $xz = yz$, then what is the value of z ?

- A. $x - y$
- B. 1
- C. x/y
- D. y/x
- E. 0

39. If $2a + 2b = 1$, and $6a - 2b = 5$, which of the following statements is true?

- A. $3a - b = 5$
- B. $a + b > 3a - b$
- C. $a + b = -2$
- D. $a + b < 3a - b$
- E. $a + b = -1$

40. Which of the following equations can be used to find a number n such that if you multiply it by 3 and take 2 away, the result is 5 times as great as if you divide the number by 3 and add 2?

- A. $3n - 2 = 5 + (n/3 + 2)$
- B. $3n - 2 = 5(n/3 + 2)$
- C. $3n - 2 = 5n/3 + 2$
- D. $5(3n - 2) = n/3 + 2$
- E. $5n - 2 = n/3 + 2$

41. If $3/2 x = 5$, then $2/3 + x =$

- A. $10/3$
- B. 4
- C. $15/2$
- D. 8
- E. 12

42. If $x + y = 12$ and $x^2 + y^2 = 126$ then $xy =$

- A. 9
- B. 10
- C. 11
- D. 13
- E. 16

43. If $\frac{7a-5b}{b} = 7$, then $\frac{4a+6b}{2a}$ equals

- A. $15/4$
- B. 4
- C. $17/4$
- D. 5
- E. 6

44. The fraction

$$\frac{7x - 11}{x^2 - 2x - 15}$$

was obtained by adding the two fractions

$$\frac{A}{x - 5} + \frac{B}{x + 3}$$

The values of A and B are:

- A. $A = 7x, B = 11$
- B. $A = -11, B = 7x$
- C. $A = 3, B = 4$
- D. $A = 5, B = -3$
- E. $A = -5, B = 3$

45. If average of {28, 36, x} is 29, then what is x?

- A. 23
- B. 32
- C. 21
- D. 4
- E. 5

46. Solve for x :

$$\frac{5}{x} = \frac{2}{x-1} + \frac{1}{x(x-1)}$$

- A. -1
- B. 0
- C. 1
- D. 2
- E. 3

47. If $2X + Y = 2$ and $X + 3Y > 6$, then

- A. $Y \geq 2$
- B. $Y > 2$
- C. $Y < 2$
- D. $Y \leq 2$
- E. $Y = 2$

48. The expression $(x + y)^2 + (x - y)^2$ is equivalent to

- A. $2x^2$
- B. $4x^2$
- C. $2(x^2 + y^2)$
- D. $2x^2 + y^2$
- E. $x^2 + 2y^2$

49. If $x + y = \frac{1}{k}$ and $x - y = k$, what is the value of $x^2 - y^2$?

- A. 4
- B. 1
- C. 0
- D. k^2
- E. $\frac{1}{k^2}$

50. If $3^{a-b} = \frac{1}{9}$ and $3^{a+b} = 9$, then $a =$

- A. -2
- B. 0
- C. 1
- D. 2
- E. 3