RAVI MATHS TUITION CENTER PH - 8056206308

ALGEBRA FILL TEST

10th Standard

Maths

Reg.No. : | | | | | | |

Exam Time : 02:30:00 Hrs

Total Marks : 1

14 x 1 =

1) A system of three linear equations in three variables is inconsistent if their planes
(a) intersect only at a point (b) intersect in a line (c) coincides with each other (d) do not intersec

2) The solution of the system x + y − 3x = −6, −7y + 7z = 7 , 3z = 9 is
(a) x = 1, y = 2, z = 3 (b) x = −1, y = 2, z = 3 (c) x = −1, y = −2, z = 3 (d) x = 1, y = 2, z = 3

3) If (x - 6) is the HCF of x^2 - 2x - 24 and x^2 - kx - 6 then the value of k is
(a) 3 (b) 5 (c) 6 (d) 8

4) $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is
(a) $\frac{9y}{7}$ (b) $\frac{9y^2}{(21y-21)}$ (c) $\frac{21y^2-42y+21}{3y^2}$ (d) $\frac{7(y^2-2y+1)}{y^2}$

5) $y^2 + \frac{1}{y^2}$ is not equal to
(a) $\frac{y^2+1}{y^2}$ (b) $\left(y+\frac{1}{y}\right)^2$ (c) $\left(y-\frac{1}{y}\right)^2+2$ (d) $\left(y+\frac{1}{y}\right)^2-2$

6) $\frac{x}{x^2-25} - \frac{8}{x^2+6x+5}$ gives
(a) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (b) $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$ (c) $\frac{x^2-7x+40}{(x^2-25)(x+1)}$ (d) $\frac{x^2+10}{(x^2-25)(x+1)}$

7) The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
(a) $\frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ (b) $16\left|\frac{y^2}{x^2z^2}\right|$ (c) $\frac{16}{5}\left|\frac{y}{xz^2}\right|$ (d) $\frac{16}{5}\left|\frac{xz^2}{y}\right|$

8) Which of the following should be added to make x^4 + 64 a perfect square
(a) $4x^2$ (b) $16x^2$ (c) $8x^2$ (d) $-8x^2$

9) The solution of $(2x - 1)^2 = 9$ is equal to
(a) -1 (b) 2 (c) -1, 2 (d) None of these

10) The values of a and b if $4x^4$ - $24x^3$ + $76x^2$ + ax + b is a perfect square are
(a) 100, 120 (b) 10, 12 (c) -120, 100 (d) 12, 10

11) If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r =$ 0, then q, p, r are in _____.
(a) A.P (b) G.P (c) Both A.P and G.P (d) none of these

12) Graph of a linear polynomial is a
(a) straight line (b) circle (c) parabola (d) hyperbola

13) The number of points of intersection of the quadratic polynomial x^2 + 4x + 4 with the X axis is
(a) 0 (b) 1 (c) 0 or 1 (d) 2

14) Which of the following can be calculated from the given matrices A = $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$, B = $\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$,

(i) A^2

(ii) B^2

(iii) AB

(iv) BA

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (ii) and (iv) only (d) all of these

10 x 2 =

15) The father's age is six times his son's age. Six years hence the age of father will be four times his son's age. Find the present ages (in years) of the son and father.

16) Solve $2x - 3y = 6$, $x + y = 1$

17) Find $\frac{x^2+20x+36}{x^2-3x-28} - \frac{x^2+12x+4}{x^2-3x-28}$

18) Solve $2x^2 - 2\sqrt{6}x + 3 = 0$

19) If the difference between the roots of the equation $x^2 - 13x + k = 0$ is 17. find k

20) If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ show that $(AB)^T = B^T A^T$

21) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

22) Find the square root of the following expressions

$256(x - a)^2 (x - b)^4 (x - c)^{16} (x - d)^{20}$

23) If $A = \begin{bmatrix} 5 & 4 & -2 \\ \frac{1}{2} & \frac{3}{4} & \sqrt{2} \\ 1 & 9 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -7 & 4 & -3 \\ \frac{1}{4} & \frac{7}{2} & 3 \\ 5 & -6 & 9 \end{bmatrix}$, find 4A - 3B.

24) Find the value of a, b, c, d, x, y from the following matrix equation.

$\begin{bmatrix} d & 8 \\ 3b & a \end{bmatrix} + \begin{bmatrix} 3 & a \\ -2 & -4 \end{bmatrix} = \begin{bmatrix} 2 & 2a \\ b & 4c \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ -5 & 0 \end{bmatrix}$

25) Find the LCM of the following

$x^3 - 27$, $(x - 3)^2$, $x^2 - 9$.

26) Find

$\frac{16x^2-2x-3}{3x^2-2x-1} \div \frac{8x^2+11x+3}{3x^2-11x-4}$

27) Find the values of 'k' such that quadratic equation $(k + 9)x^2 + (k+1)x + 1 = 0$ has no real roots?

28) Discuss the nature of solutions of the following quadratic equations.

$x^2 + 2x + 5 = 0$

10 x 5 =

29) Solve $\frac{1}{3}(x + y - 5) = y - z = 2x - 11 = 9 - (x + 2x)$

30) In a three-digit number, when the tens and the hundreds digit are interchanged the new number is 54 mo than three times the original number. If 198 is added to the number, the digits are reversed. The tens digi exceeds the hundreds digit by twice as that of the tens digit exceeds the unit digit. Find the original number.

31) Find the GCD of the following by division algorithm $2x^4 + 13x^3 + 27x + 7$, $x^3 + 3x^2 + 3x + 1$, $x^2 + 2x +$

32) Find the square root of $289x^4 - 612x^3 + 970x^2 - 684x + 361$

33) Discuss the nature of solutions of the following system of equations

$x + 2y - z = 6$; $-3x - 2y + 5z = -12$; $x - 2z = 3$

34) Find the values of a and b if the following polynomials are perfect squares

$4x^4 - 12x^3 + 37x^2 + bx + a$

35) A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more it would ha taken 30 minutes less for the journey. Find the original speed of the bus.

36) Two women together took 100 eggs to a market, one had more than the other. Both sold them for the same sum of money. The first then said to the second: "If I had your eggs, I would have earned Rs.15",

which the second replied: “If I had your eggs, I would have earned Rs.6 ". How many eggs did each h in the beginning? $\frac{2}{3}$

37) If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - 4ac = 0$ are real and equal prove that either a = (or) $a^3 + b^3 + c^3 = 3abc$.

38) Find X and Y if $X + Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

39) Solve for x, y : $\begin{bmatrix} x^2 \\ y^2 \end{bmatrix} + 2\begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} -5 \\ 8 \end{bmatrix}$

40) Let $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$ Show that A(BC) = (AB)C

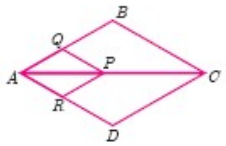
41) If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ show that $A^2 - (a + d)A = (bc - ad)I_2$

42) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I_2 = 0$

43) a) Construct a triangle similar to a given triangle LMN with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle LMN (scale factor $\frac{4}{5}$).

(OR)

b) In fig. if PQ||BCandPR||CD prove that



$$\frac{AB}{AD} = \frac{AQ}{AB}$$

44) a) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$

(OR)

b) Draw the graph of $y = (x - 1)(x + 3)$ and hence solve $x^2 - x - 6 = 0$

****