MATHS

BOOKS - UNITED BOOK HOUSE

MODEL QUESTION PAPERS-SET 13

Exercise

1. If n(x) = 4, n (Y) = 3 and $n(X \times Y \times Z) = 24,$

then the value of n(Z) is

A. a)1

B. b)2

C. c)3

D. d)4

Answer:

▶ **Watch Video Solution**

2. m is a positive integer. If $\left(\dfrac{1+i}{1-i}\right)^{m} = 1$,then least value of m will be

A. a)4

B. b)3

C. c)2

D. d)1

Answer:

3. In the expansion $\left(P + \dfrac{1}{P}\right)^{10}$,the middle term will be

A. a)$^{10}C_4 P^2$

B. $^{10}C_4 1/P^2$

C. c)$^{10}C_5$

D. d)$^{10}C_6 1/P^6$

Answer:

▶ **Watch Video Solution**

---

4. Sum of 1st pth natural odd number is

A. a)$\dfrac{P(P+1)}{2}$

B. b)P^2`

C. c)P/2

D. d)$\dfrac{P^2}{4}$

Answer:

5. The distance between the two straight lines

4x + 3y= 11 and 8x+ 6y = 15 is

A. a)1/2 unit

B. b)4/11 unit

C. c)7/10 unit

D. d)11/3 unit

Answer:

6. If two cricles $x^2 + y^2 + 2gx + 2fy = 0$ and

$x^2 + y^2 + 2g'x + 2f'y = 0$ touch each other,

then

A. a)ff' = gg'

B. b)f'g = fg'

C. c)fg = fg'-

D. d)$ff = gg'^2$.

Answer:

▶ **Watch Video Solution**

7. The value of $\lim\limits_{x \to 7} \dfrac{x - 7}{|x - 7|}$ is

A. a)0

B. b)1

C. c)-1

D. d)none of these.

Answer:

8. If $y = x + 1/x$, then $dy/dx = 0$ at the point

A. a)(2,1/2)

B. b)(2,-1)

C. c)(1,-2)

D. d)(1,2)&(-1,-2).

Answer:

9. Two dice are thrown at a time. The probability that the sum of two numbers are 3 or 5or 11 is

A. a)1/9

B. b)2/9

C. c)3/19

D. d)11/19.

Answer:

▶ **Watch Video Solution**

10. Arithmetic mean of 1, 2, 3,..-..... , 100 (1st 100 positive integers) is
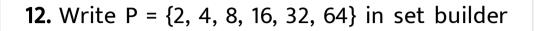
A. a)50

B. b)50.5

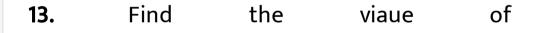C. c)51.5

D. d)49.5

Answer:

▶ **Watch Video Solution**

11. If R =

$\{(x, y) : x \in N, y \in N \text{ and } 2x + y = 10\}.$

then find R^{-1}

▶ **Watch Video Solution**

12. Write P = {2, 4, 8, 16, 32, 64} in set builder form.

> ▶ **Watch Video Solution**

13. Find the viaue of

$$\tan 28° + \tan 17° + \tan 28° \tan 17°$$

> ▶ **Watch Video Solution**

14. Solve : $\sin 3\theta = \cos 3\theta (0 < \theta < \pi)$

15. Find the amplitude of i/(1-i).

16. In how many different ways 4 boys and 3 girls can be sitted in one row so that two girls are not together?

17. Find the middle term of the expansion of

$$\left(\frac{a^2}{3} + \frac{3}{a^2}\right)^8$$

18. The sum of the 1st m terms of an AP is n

and the sum of the 1st n terms of the same AP

is m. Find the sum of the 1st (m + n) terms of

the AP.

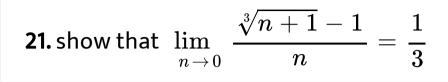**19.** The co-ordinate of the vertices of a triangle are (2, -2), (4, 2) and (-1. 3). Find the equation of the median which passes through (-1. 3).

20. Find the co-ordinate of that point which divides the line segment joining the points (-2, 5, 1) and (3.-5, 6) in the ratio 3 : 2 internally.

21. show that $\lim\limits_{n \to 0} \dfrac{\sqrt[3]{n+1}-1}{n} = \dfrac{1}{3}$

 Watch Video Solution

22. If $y = \dfrac{x}{x+a}$,show that x dy/dx = y (1- y)
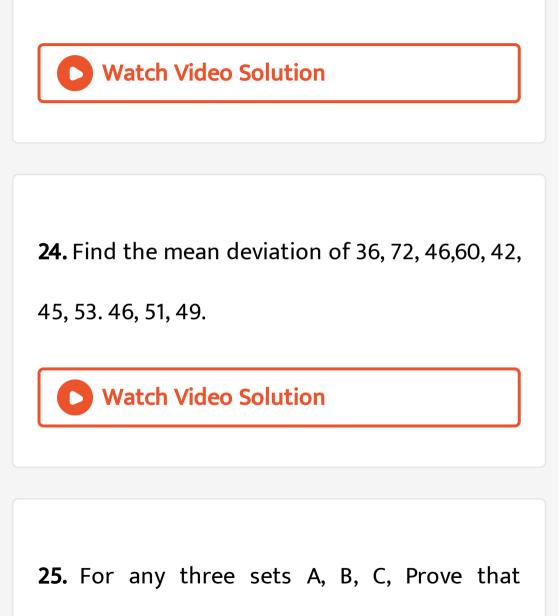
 Watch Video Solution

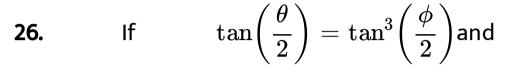**23.** A box contains 50 articles of which 4 are

defective. One article is taken at random from

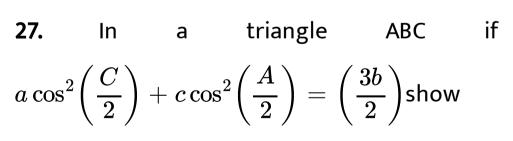the box. Find the probability of that article is

not defective. .

24. Find the mean deviation of 36, 72, 46,60, 42,

45, 53. 46, 51, 49.

25. For any three sets A, B, C, Prove that

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.

26. If $\tan\left(\dfrac{\theta}{2}\right) = \tan^3\left(\dfrac{\phi}{2}\right)$ and $\tan\phi = 2\tan\alpha$,then prove that $\theta + \phi = 2\alpha$

27. In a triangle ABC if $a\cos^2\left(\dfrac{C}{2}\right) + c\cos^2\left(\dfrac{A}{2}\right) = \left(\dfrac{3b}{2}\right)$ show that sides of the trianglea are in A.P.

28. Prove that by mathematical induction : $3^{2n+2} - 8n - 9$ is divisible by 64 where $n \in N$.

29. If x=a+b,$y = aw + bw^2, z = aw^2 + bw$,show that $xyz = a^3 + b^3$

30. if the ratio of the sum of n terms of two A Ps is (3n + 5) : (5n - 9). Show that their 4th terms are equal.

31. The coefficient of three consecutive terms in the expansion of $(1 + x)^n$ are a, b, c respectively prove that $\dfrac{2ac + b(a + c)}{b^2 - ac} = n$.

32. Show that the straight line $(a + 2b) x + (a - 3b)y + b - a = 0$ always passes through a fixed point. Find the co-ordinate of that point.

33. Find the equations of straight line which are perpendicular to the straight line $4x - 3y + 7 = 0$ and at a distance 3 unit from the origin.
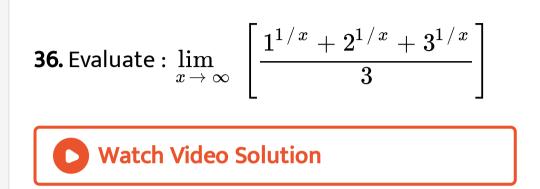
34. $y = 2x$ is a chord of the circle $x^2 + y^2 - 10x = 0$. Find the equation of a circle whose diameter is the chord of, given circle

35. Find the ratio in which the plane 2x + 2y - 2z = 1 divides the line segment joining the points A(2,1, 5) and B(3, 4, 3). Find the co ordinate of point of contact.

36. Evaluate : $\lim\limits_{x \to \infty} \left[\dfrac{1^{1/x} + 2^{1/x} + 3^{1/x}}{3} \right]$

37. Differentiate $x^{-\frac{2}{3}}$ with respect to x, with behalf of definition.

38. Prove that $\sqrt{3}$ is irrational, (use the method of contradiction)

39. If x and y are odd integers, then xy is also an odd integer r examine its truth value.
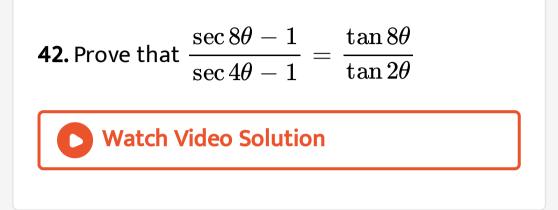
40. The probability of occurrence of at least one event of two events X and Y is 0.6.-If the probability of occurrence both is 0.2, find $P(\overline{X}) + P(\overline{Y})$

41. If the co-efficient of variation of two frequeny distribution are 58% and 64% and their SD are 21.2 and 15.2 resp.. Find AM of the distribution.
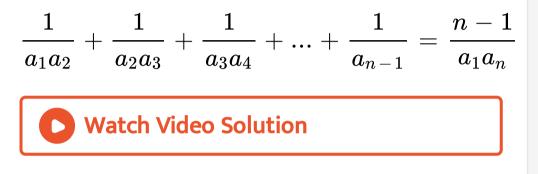
42. Prove that $\dfrac{\sec 8\theta - 1}{\sec 4\theta - 1} = \dfrac{\tan 8\theta}{\tan 2\theta}$

43. In $\triangle ABC$,Prove that a cos A + b cos B + c cos C = 2a sin B sin C

44. If $a_1, a_2, a3, ..., a_a$ are in A.P then show that

$$\frac{1}{a_1 a_2} + \frac{1}{a_2 a_3} + \frac{1}{a_3 a_4} + ... + \frac{1}{a_{n-1}} = \frac{n-1}{a_1 a_n}$$

45. Solve $x^2 - (7-i)x + (18-i) = 0$ and hence prove that the roots are not conjugate.

46. The Indian cricket eleven is to be selected out of 15 players. 6 of them bowlers and 9 of them batsman. In how many ways the team can be selected so that the team contains at least 3 bowlers.

▶ Watch Video Solution

47. Draw the graph and' find the common region of the system of following inequations :

$2x + 5y \le 40.x + y \le 1, x \ge 0, y \ge 0.$

48. If the point $P(at^2, 2at)$ is a end point of a chord of the parabola $y^2 = 4ax$ which is passes through the focus, then the length of the chord is

49. In a hyperbola, (a) centre is origin (b) transverse axis along-with x axis (c) length of conjugates axis is 5 unit, (d) distance between

two foci is 13 unit. Find the equation of the hyperbola.

> ▶ **Watch Video Solution**

50. find the equation of the ellipse whose eccentricities is 1/2, focus is (-1, 1), directrix is y = x + 3.

> ▶ **Watch Video Solution**