MATHS

BOOKS - UNITED BOOK HOUSE

MODEL QUESTION PAPERS-SET 2

Exercise

1. If P and Q are any two set then P-Q=

A. a) $P' \cap Q'$

B. b) $P' \cup Q'$

C. c) $P \cap Q'$

D. d) $P \cup Q'$

Answer:

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2. For what value of m,n, the relation $\sqrt{mn} = \sqrt{m}.\sqrt{n}$is not correct ?

A. a)m=5,n=3

B. b)m=-5,n=3

C. c)m=-5,n=-3

D. d)m=5,n=-3.

Answer:

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3. In the expansion $\left(2p - \frac{1}{2p}\right)^{10}$,the middle term will be

A. a) $\frac{1}{2^2}$ ^10C_4`

B. b) $-{}^{10}C_5$

C. c) ` $10C_5$

D. d) $-\frac{1}{2^2}$ ^10C_4`

Answer:

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4. If the roots of the equation $(x - \alpha)(x - \beta) = c$is a,b;then the equation whose roots are α,β is

A. a)(x-a)(x-b)=0

B. b)$(x-a)(x-\beta)-c=0$

C. c)$(x-\beta)(x-b)+c=0$

D. d)(x-a)(x-b)+c=0

Answer:

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5. Find the area of the triangle formed by the straight lin $x\cos\alpha+y\sin\alpha=P$and two coordinates axis.

A. a)$P\cos ec2\alpha sq.\ unit$

B. b)`P^2cosec2alpha sq.unit

C. c)$\frac{1}{2}p\cos ec2\alpha sq.\ unit$

D. d)$\frac{1}{2}p^2\cos ec2\alpha sq.\ unit$

Answer:

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6. The equation of circle which touches x axis at origin and radius is r units is

A. a)$x^2 + y^2 = 2rx$

B. b)$x^2 + y^2 = 2ry$

C. c)$x^2 + y^2 + 2rx = 0$

D. d)$x^2 + y^2 + 2ry = 0$

Answer:

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7. The value of $\lim_{x \to \infty} a^x \sin\left(\frac{b}{a \to thepowerx}\right), (a, b > 1)$ is

A. a)log a

B. b)log b

C. c)a

D. d)b

Answer:

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8. If f(x)=x|x|,then the value of f'(x) is

A. a)$\pm \frac{1}{2}$

B. b)± 1

C. c)v|x|

D. d)2|x|.

Answer:

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9. How many numbers of five digits can be formed with the digits 0,1,2,3,4, repetitions s being not allowed?

A. a)48

B. b)96

C. c)144

D. d)210

Answer:

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10. The A.M of 1,2,3,4,.....100 is

A. a)50.55

B. b)55.5

C. c)50.5

D. d)55.5

Answer:

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11. If P={x:x=4n+1,$n \leq 5$and $n \in N$}and Q ={3n:$n \leq 8$and $n \in N$},find the set (P-Q).

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12. If mRn=[(m,n):m-n is divisible by 5}is the relation with N set,find $(3Rn) \cap (5Rn)$

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13. Find the maximum value of $\frac{1}{2}\sin^2\theta + \frac{1}{3}\cos^2\theta$

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14. Show that

$\tan 8\alpha - \tan 5\alpha - \tan 3\alpha = \tan 8\alpha \tan 5\alpha \tan 3\alpha$

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15. Show that

$\left(x + yw + zw^2\right)^2 + \left(xw^2 + y + zw\right)^2 + \left(xw + yw^2 + z\right)^2 = 0$

,where w is an cube (imaginary) root of 1.

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16. What is the permutations of the letters in the word CAMBRIDGE when M,R,D are not together?

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17. Which term of the expansion of $\left(2x^2 - x^{-1}\right)^{12}$ is the term independent of x.

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18. Find the least value of a when a+b=4 and $2a + 3b \leq 25$

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19. Find the perpendicular distance from (2,3,4) to x- axis and z- axis.

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20. Convert the straight line $\sqrt{3}x + y + 14 = 0$ into normal form.

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21. Evaluate : $\lim_{x \to a} \frac{\sqrt[3]{x} - \sqrt[3]{a}}{x - a}$

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22. IS the derivative of the function f(x)=|x| at x=0.possible?

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23. In a frequancy distribution,if the mean = 35 & median = 33, then find the mode of the frequency distribution.

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24. A box contains 6 white balls and 4 black balls, A ball is drawn at random from the box. What is the probability that the ball is white.

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25. In three sets P,Q,R if $P \cup R = P \cup Q$and $P \cap Q = P \cap R$,then show that Q=R.

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26. Show that, $\tan 7\left(\frac{1^{\circ}}{2}\right) = \sqrt{6} - \sqrt{3} + \sqrt{2} - 2$

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27. Prove by mathematical induction, $n.1 + (n-1).2 + (n-2).3 + \ldots + 2.(n-1) + 1.n = \frac{n(n+1)(n+2)}{6}$ where $n \in N$.

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28. If $a + ib = \sqrt{\frac{x+iy}{p+iq}}$, show that $\left(a^2 + b^2\right)^2 = \frac{x^2 + y^2}{p^2 + q^2}$

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29. If the p^{th}, q^{th} and r^{th} terms of a G.P. are x, y, z respectively. then show that : $x^{q-r}.y^{r-p}.z^{p-q}=1$

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30. The co-efficients of the expansion of $(1+x)^{2n-1}$ and $(1+x)^{2n}$ are P and Q resp.Calculate the relation between P and Q.

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31. The co-ordinates of the vertices of a quadrilateral are (3,-2)(6,2)(4,3) and (-1,0) resp.Find the area of the quadrilateral.

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32. 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.

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33. A circle through the common points of the circles $x^2 + y^2 - x + 7y - 3 = 0$and $x^2 + y^2 - 5x + y + 1 = 0$ has its centre on the line x+y=0.Find the equations of the circle.

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34. Find the equations of the two straight line parallel to the line 3x+4y=15and at a distance of 7.5 unit from the point (1,-2).

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35. Evaluate : $\lim_{x \to 0} \frac{(a+x)^2 \sin(a+x) - a^2 \sin a}{\pi}$

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36. If the derivatives of f(x) at x=a is f'(a) ,then show that $\lim_{x \to a} \frac{xf(a) - af(x)}{x - a} = f(a) - af'(a)$

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37. If n is a such real number that n>3 .then $n^2 > 9$ prove it by the method of contradiction.

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38. From 20 cards marked with the 1st 20 natural numbers.one is drawn at random ,find the probability that it is a)prime number b) multiple of 5.

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39. Find the mean of first ten natural numbers

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

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41. Find the value of $\frac{1}{2}\sec 80^\circ - 2\cos 20^\circ$

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42. Find the common solution region by graphical method.

$2x + y \geq 2, x - y \leq 1, x + 2y \leq 8, x > 0, y \geq 0$

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43. Solve. $\sqrt{3}x^2 - \sqrt{2}x + 3\sqrt{3} = 0$

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44. Find the sum to n terms : $\frac{1}{2}+\frac{3}{2^2}+\frac{5}{2^3}+\ldots+\frac{2n-1}{2^n}$

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45. If the sum of the first m terms of an A.P. is equal to the sum of either the next n terms or the next p terms, prove that, $(m+n)\left(\frac{1}{m}-\frac{1}{p}\right)=(m+p)\left(\frac{1}{m}-\frac{1}{n}\right)$

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46. PQ is a double ordinate of the parabola $y^2=4ax$ Show that thelocus of its point of trisection the chord PQ is

$9y^2 = 4ax.$

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47. Show that for all values of t the point $x = c\left(\frac{1+t^2}{1-t^2}\right)$, $y = \frac{2ct}{1-t^2}$lia.on a on a fixed hyperbola. What is the eccentricity of the hyperbola.

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48. The eccentric angles of the two points P and Q on the ellipse$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1(a > b)$are θ and ϕ resp.If the chord PQ makes angle 90° with the vertex (a,0)of the ellipse then show that $\tan\left(\frac{\theta}{2}\right)\tan\left(\frac{\phi}{2}\right) = -\frac{b^2}{a^2}$

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