MATHS

BOOKS - UNITED BOOK HOUSE

KALIDHAN INSTITUTION

Exercise

1. If $\sin\theta + \sin\phi = 2$,then what is the value of $\cos(\theta + \phi)$?

A. a)0

B. b)1

C. c)-1

D. d)2

Answer:

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2. If z and w are two non-zero complex numbes such that $|z|=|w|$ and $\arg z+\arg w=\pi$, then the value of z is

A. a)$\overline{w}$

B. b)-$\overline{w}$

C. c)w

D. d)-w

Answer:

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3. Suppose a,b,c are in A.P and a^2, b^2, c^2 are in G.P if a

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

B. b) $\frac{1}{2\sqrt{3}}$

C. c) $\frac{1}{2} - \frac{1}{\sqrt{3}}$

D. d) $\frac{1}{2} - \frac{1}{\sqrt{2}}$

Answer:

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4. The number of terms in the expansion of $(a+b+c)^{10}$ is

A. a)55

B. b)66

C. c)33

D. d)44

Answer:

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5. The equation of a line which makes an angle 45° with x-axis and cuts the y=axis is at (0,3) is

A. a)$y=x+3$

B. b)$y=3$

C. c)$x=3$

D. d)None of these

Answer:

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6. The point P divides the line-segment joining the points A(1,5)and B(-4,7) internally in the

ratio 2:3.State which of the following is abscissa of P?

A. a)-1

B. b)11

C. c)1

D. d)-11

Answer:

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7. The digit in the unit's place of the number $\left[(183)!+3^{183}\right]$ is-

A. a)4

B. b)2

C. c)3

D. d)7

Answer:

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8. The maximum value of $\sin\theta\cos\theta$is

A. a)1/2

B. b)1

C. c)2

D. d)∞

Answer:

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9. There are two children in a family.One of them is a girl child .What is probability that the other one is also a girl child?

A. a)0

B. b)1/2

C. c)1

D. d)cant be determined.

Answer:

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10. The probability that in a family of 5 members, exactly 2 members have birthday on Sunday is -

A. a) $\frac{12 \times 5^3}{7^5}$

B. b) $\frac{10 \times 6^2}{7^5}$

C. c)2/3

D. d) $\frac{10 \times 6^3}{7^5}$

Answer:

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11. The angles of a triangle are in the ration 5:4:3 .Find the circular measure of the greatest angle.

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12. Prove that, $\sqrt{\frac{\sec\theta - 1}{\sec\theta + 1}} = \cos ec\theta - \cot\theta$

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13. If A,B,C are positive acute angles and $\tan A = \frac{4}{7}$and tan B=1/7,tan C=1/8 prove that $A + B + C = 45^\circ$

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

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15. Find out the three cube-roots of 8.

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16. In how many ways can the results of the three football matches be predicted?

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17. State the binomial theorem for a positve integral index.

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18. Is 600 a terms of the A.P{7,11,15,19,...}.Give reason for your answer.

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19. Find the equation of the line which passes through the point (4,-6)and mkes intercepts on the axes equal in magnitude.but opposite in sign.

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20. The co-ordinates of a moving point P are.

$$\left[\frac{a}{2}(\cos ec\theta + \sin\theta)\frac{b}{2}(\cos ec\theta - \sin\theta)\right]$$

where θ is a variable parameter.Show that,the equation to the locus of P is $b^2x^2 - a^2y^2 = a^2b^2$

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21. Find the value of p so that the roots of the equation $3x^2 - 2(7+9p)x + (8-5p) = 0$ are reciprocal to one another.

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22. Do you think 4 as a complex number?if so why ?

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23. Two unbaised dice are rolled together.Find the probability getting 2 digits,the sum of which is 7.

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24. What is the chance that a leap year selected at random will contain 53 sundays?

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25. $\sin\alpha + \sin\beta = a$ and $\cos\alpha + \cos\beta = b$ prove that ,

$$\tan\left(\frac{\alpha-\beta}{2}\right) = \pm\sqrt{\frac{4-a^2-b^2}{a^2+b^2}}$$

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26. $\sin\theta = k\sin(\theta+\phi)$.show that $\tan(\theta+\phi) = \dfrac{\sin\phi}{\cos\phi - K}$

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27. Prove by the principle of mathematical induction that.$4^n + 15n - 1$is a mulitple of 9 for all $n \in N$.

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28. If w be a imaginary cube root of uniyt and a+b+c=0 then show that $\left(a+bw+cw^2\right)^3+\left(a+bw^2+cw\right)^3=27abc$

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29. In a machine,there is a password of five characters of which the first three letters and the last two are digits.How many passwords can be formed?

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30. If the term independetn of x in the expansion of $\left(\frac{k}{3}x^2 - \frac{3}{2x}\right)^9$ be 2268,find the value of K.

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31. Find the sum $:3.1^2 + 4.2^2 + 5.3^2 + \ldots$ upto n terms.

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32. A straight line passes through the point (2,3) and is such that the portion of intercepted between the axes is divided internally at that point in the ration 4:3.Find the equaiton of the straight line.

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33. Find the image of the point (3,8) with respect to the line $x + 3y = 7$ assuming the line to be a plane mirror.

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34. The sum of the distances of a moving point from the points (c,0)and (-c,0) is always 2a unit (a>c).Find the equation to the locus of the moving point.

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35. If the sum of first n terms of a G.P is p and the sum of the first 2n terms is 3p,show that the sum of first 3n terms is7p.

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36. The roots of the equation $x^2 + 3x + 4 = 0$are $\alpha$and β.Form the equations whose roots are $(\alpha + \beta)^2$and $(\alpha - \beta)^2$

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37. Foe any two events A and B prove that , $P(A) \geq P(A \cap B) \geq P(A) + P(B) - 1$

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38. Two fair dice are thrown simultaneously .The two scores are then multiplied together.Calculate the probability that the prodcut is A)12 and B)even.

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39. Find the maximum and minimum values of $3\sin\theta + 4\cos\theta + 5$

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40. Find the locus of a point which forms a triangle of area 21 square unit with the points (2,-7)and (-4,3).

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41. Show that $\sin 16^\circ + \cos 16^\circ = \frac{1}{\sqrt{2}}\left(\sqrt{3}\cos 1^\circ + \sin 1^\circ\right)$

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42. Sin A=m sin B,show that ,

$$\tan\left(\frac{A-B}{2}\right)=\frac{m-1}{m+1}\tan\left(\frac{A+B}{2}\right)$$

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43. Exhibit graphically the solution sets of the following system of linear inequations.

$x-2y\leq 3,3x+4y\geq 12,x\geq 0,y\geq 0$

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44. State the fundamental theorem of algebra.solve the following in the complex space:$6x^2 - (18 + 5i)x + 18 + i = 0$

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45. How many 4 digit numbers can be formed form the digits,1,1,2,2,3,3,4,4,5,5?

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46. Find the sum upto n terms:0.7+0.77+0.777+...

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47. The co-ordinates of A,B,C are (6,3),(-3,5)and (4,-2) respectively and P is the point (x,y) show that , $\frac{areaofthe\ \triangle\ PBC}{areaofthe\ \triangle\ ABC} = \left|\frac{x+y-2}{7}\right|$

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48. The equations of two sides of a square are $5x+12y-10=0$ and $5x+12y+29=0$ and the third side passes through (3,5):find equations of all other possible sides of the square.

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49. Find the equations of the lines passing thorugh the point (4,5)making equal angles with the lines $3x=4y+7$ and $5y=12x+6$.

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50. Write the two meanings of statistics.

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51. Define attribute with examples.

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52. Distinguish between discrete and continuous variable.

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53. Define primary data with examples.

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54. Define time-series data with examples.

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55. Define Pilot survey.

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56. Define tabulation.

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57. Write two uses of ogive.

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58. Ifω is the imaginary cube root of unity and a+b+c=0 then show that $(a+b\omega+c\omega^2)^3+(a+b\omega^2+c\omega)^3=27abc$

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59. Define impossible event with examples.

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60. Describe the different parts of a table.

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61. Describe the different parts of a table.

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62. Distinguish between Histogram and Bar diagram.

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63. Write the uses of Geometric mean.

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64. Show that $\sum_{i=1}^{n}(x_i - A)^2$ is minimum when $A = \bar{x}$.

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65. Prove that $\bar{x}_1 < \bar{x} < \bar{x}_2$ where the symbols have their usual meanings.

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66. If $y = a + bx$, then show that $Me(y) = a + b$ $Me(x)$.

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67. Show it with an experiment that different materials have different ability to conduct heat through them.

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68. Write the classical definition of probability and state its limitations.

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69. For any two events A and B, show that, $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.

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70. How would you construct a frequency distribution of a continuous variable?

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71. A variable takes values, a, ar, ar^2,....., ar^{n-1} with equal frequencies. Find AM, GM and HM and hence show that $(GM)^2 = A.M. \times H.M.$

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72. State and prove Cauchy-Schwartz inequality.

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