- PU I Year Trigonometry

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1. The angle between Hr.hand and Min. hand of a clock when the time is 3 : 20

1) 10° 2) 20° 3) 30° 4) $22\frac{1^\circ}{2}$

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2. The vertical angle of an isosceles triangle is 45° then the base angle in circular measure is

(1) $67^\circ\ 30'$ (2) $65^\circ\ 30'$ (3) $\frac{3\pi}{8}$ (4) $\frac{3\pi}{16}$

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3.If the length of a chord of a circle is equal to that of the radius of the circle, then the angle subtended in radians at the centre of the circle by chord is

1) 1 2) $\frac{\pi}{2}$ 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{4}$

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4. If $\text{SinA} + \frac{1}{\text{SinA}} = \frac{5}{2}$ and A is acute then A is

1) $\frac{\pi}{6}$ 2) $\frac{\pi}{4}$

3) $\frac{\pi}{3}$ 4) None of these

5.If $\sec\theta + \tan\theta = 2$, then the values of $\sec\theta$ & $\tan\theta$ are respectively

1) $\frac{1}{4}, \frac{2}{3}$ 2) $\frac{5}{4}, \frac{3}{4}$ 3) $\frac{2}{3}, \frac{1}{4}$ 4)None

6. The value of $\cos^2 85 + \cos^2 5$, is

1)0 2)-1 3)1 4)$\frac{1}{2}$

7. The maximum value of $4\sin\theta + 3\cos\theta + 2$, is

1)7 2)4 3)6 4)5

8. $\sin\theta + \cos\theta = 1$,

then $\sin 2\theta =$

1)1 2)-1 3)0 4)2

9. If $\cos\theta + \sec\theta = 2$, then the

value of $\cos^{100}\theta - \sec^{100}\theta =$

1)0 2)1 3)2 4)-1

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10. If $\sec\theta + \tan\theta = 4$ then

$\cos\theta$ =

1) $\frac{8}{15}$ 2) $\frac{15}{17}$ 3) $\frac{8}{17}$ 4) $\frac{7}{17}$

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11. The value of $\tan 20^\circ + \tan 40^\circ + \tan 60^\circ + \ldots + \tan 180^\circ$, is

1)0 2)1 3)2 4)4

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12.The value of

$$\frac{\sin^2\alpha}{1+\cot^2\alpha}+\frac{\tan^2\alpha}{(1+\tan\alpha)^2}+\cos^2\alpha$$

1) -1 2) 0 3) 1 4) 2

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13. A,B,C are the angles of a ΔABC, then

$$\text{Cos}\left(\frac{3A+2B+C}{2}\right)+\text{Cos}\left(\frac{A-C}{2}\right)=$$

1)1 2)0 3)CosA 4)CosC

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14. If $x = \cos 1^\circ$ and $y = \cos 1$ then

1) $x = y$ 2) $x < y$

3) $x > y$ 4) $2x = y$

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15. In a ΔABC, $C = 90^\circ$, then the equation whose roots are tanA & tanB is

1) $abx^2 + c^2x + ab = 0$ **2)** $abx^2 + c^2x - ab = 0$

3) $abx^2 - c^2x - ab = 0$ **3)** $abx^2 - c^2x + ab = 0$

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16. If $5\sin x + 4\cos x = 3$, then $4\sin x - 5\cos x =$

1) 4 2) $4\sqrt{2}$ 3) $3\sqrt{2}$ 4) $\sqrt{2}$

17. If a = Sin1° and b = Sin1 then

1)a = b 2)a < b 3)a > b 4)a = 2b

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18. IF CosA = aCosB and SinA = bSinB, then $(b^2 - a^2)Sin^2B =$

1) $1 + a^2$ 2) $2 + a^2$ 3) $1 - a^2$ 4) $2 - a^2$

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19. The maximum value of $4\sin^2 x + 3\cos^2 x$ is

1)3 2)4 3)5 4)None

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20. The value of

$$\tan 100 + \tan 125 + \tan 100 \tan 125 =$$

1) 2 2) 3 3) $\frac{1}{3}$ 4) 1

21. If ABCD is a cyclic quadrilateral then

1) $\sin(A + C) = 1$ **2) $\cos(A + C) = -1$**

3) $\sin(B + D) = 1$ **4) $\cos(A + C) = 1$**

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22. For a ΔABC, $\begin{vmatrix} 1 & a & b \\ 1 & c & a \\ 1 & b & c \end{vmatrix} = 0$

then the value of

$\cos^2 A + \cos^2 B + \cos^2 C =$

1) $\frac{9}{4}$ 2) $\frac{3}{4}$ 3) $\frac{4}{9}$ 4) $\frac{4}{3}$

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23.

$$\cos^3 10^\circ + \cos^3 110^\circ + \cos^3 130^\circ =$$

1) $\frac{3}{4}$ 2) $\frac{3}{8}$ 3) $\frac{3\sqrt{3}}{8}$ 4) $\frac{3\sqrt{3}}{4}$

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24. $\cos^2 10^\circ + \cos^2 50^\circ + \cos^2 70^\circ =$

1) $\frac{1}{2}$ 2) 1 3) $\frac{3}{2}$ 4) 2

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25. If $x = \sqrt{\frac{1-\cos\theta}{1+\cos\theta}}$, then, $\frac{2x}{1-x^2} =$

1) $\sin\theta$ 2) $\cos\theta$ 3) $\tan\theta$ 4) $\cot\theta$

26. $$\frac{\cos^2\left(\frac{\pi}{4}-A\right)-\sin^2\left(\frac{\pi}{4}-A\right)}{\cos^2\left(\frac{\pi}{4}+A\right)+\sin^2\left(\frac{\pi}{4}+A\right)}=$$

1)Cos2A

2)tan2A

3)Sin2A

4)Cot2A

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27. If

$\tan\beta = 2\sin\alpha\sin\gamma\operatorname{cosec}(\alpha+\gamma)$, then $\cot\alpha, \cot\beta, \cot\gamma$ are in

1)A.P. 2)G.P. 3)H.P. 4)A.G.P.

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28. If $\cos(x-y)+\cos(y-z)+\cos(z-x)=\frac{-3}{2}$

then, $\sum \cos x =$

1)0 2)1 3)2 4)3

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29. $$\frac{\text{Minimum of } (\sin^2 x + \cos^2 x)}{\text{Maximum of } \left(\cos^2 \frac{x}{2} + \sin^2 \frac{x}{2}\right)} =$$

1) -1 2) 1 3) 2 4) -2

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30. $3\sin^2 x + 4\cos^2 x \in$

1) $[0,3]$ 2) $[0,4]$

3) $[3,4]$ 4) $[-4,-3]$

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31.The maximum value of

$$\frac{3}{5\sin x - 12\cos x + 19}$$ is

1) 1 2) $\frac{1}{2}$ 3) $\frac{1}{3}$ 4) $\frac{1}{4}$

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32. If $\tan\theta = \frac{-4}{3}$ then, $\sin\theta =$

1) $\frac{-4}{5}$ but not $\frac{4}{5}$ 2) $\frac{-4}{5}$ or $\frac{4}{5}$

3) $\frac{4}{5}$ but not $\frac{-4}{5}$ 4)None of these

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33. The value of $\sqrt{3}Cosec20° - Sec20°$ is

1) 2 2) 4

3) $\frac{2Sin20°}{Sin40°}$ 4) $\frac{4Sin20°}{Sin40°}$

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34. If $A = \cos^2\theta + \sin^4\theta$, then for all the values of θ

1) $1 \leq A \leq 2$

2) $\frac{13}{16} \leq A \leq 1$

3) $\frac{3}{4} \leq A \leq \frac{13}{16}$

4) $\frac{3}{4} \leq A \leq 1$

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35.

$$\tan 20^\circ + \tan 40^\circ + \sqrt{3}\tan 20^\circ \tan 40^\circ =$$

1) $\frac{1}{\sqrt{3}}$ 2) $\sqrt{3}$ 3) $\frac{-1}{\sqrt{3}}$ 4) $\sqrt{3}$

36. If $\cos(\alpha+\beta)=\frac{4}{5}$, $\sin(\alpha-\beta)=\frac{5}{13}$ and α and β lies between 0 and $\frac{\pi}{4}$, then $\tan 2\alpha =$

1) $\frac{16}{63}$ 2) $\frac{56}{33}$ 3) $\frac{28}{33}$ 4) None

37. The value of

$$\sin^2\frac{\pi}{8}+\sin^2\frac{3\pi}{8}+\sin^2\frac{5\pi}{8}+\sin^2\frac{7\pi}{8}$$

1)1 2)2 3)$1\frac{1}{8}$ 4)$2\frac{1}{8}$

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38. $\frac{\tan 70 - \tan 20}{\tan 50} =$

1) 3 2) 0 3) 1 4) 2

39. If

$\cos A \cos B + \sin A \sin B \sin C = 1$

then $a : b : c =$

1) $1 : 1 : 1$ **2) $\sqrt{2} : 1 : 1$**

3) $1 : \sqrt{2} : 1$ **4) $1 : 1 : \sqrt{2}$**

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40. In a ΔABC, A > B and if the measures of A and B satisfy

$3\sin x - 4\sin^3 x - k = 0$,

$0 < k < 1$ then C =

1)30 2)45 3)120 4)None

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41. ΔABC is right angled at C, then $\tan A + \tan B =$

1) $\frac{b^2}{ac}$ 2) $a+b$ 3) $\frac{a^2}{bc}$ 4) $\frac{c^2}{ab}$

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42. If P_1, P_2, P_3 are altitudes of a triangleABC, from the vertices A,B,C and Δ, the area of a triangle, then $P_1^{-1} + P_2^{-1} + P_3^{-1}$ is

1) $\frac{s-a}{\Delta}$ 2) $\frac{s-b}{\Delta}$ 3) $\frac{s-c}{\Delta}$ 4) $\frac{s}{\Delta}$

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43. If in a ΔABC, $\cos A \cos B + \sin A \sin B \sin C = 1$, then the triangle is

1) isosceles 2) right angled

3)isosceles right angled

4)equilateral

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44. If two sides a,b and angle A be such that 2 triangles are formed then the sum of two values of third side is

1) 2b SinA 2) 2b CosA

3) $\frac{b}{a}$CosA 4)(c+b)CosA

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45. $\log_x y = \log_y z = \log_z x$, then

1)$x=y=z$ 2) $x>y>z$

3)$x=y>z$ 4)$x<y<z$

46. If log 2, log(2x-1) and log(2x+3) are in A.P. then x =

1) $\frac{-1}{2}$ 2) $\frac{1}{2}$ 3) 1 4) None

47. If x, y, z are in G.P. and $a^x = b^y = c^z$, then

1) $\log_c b = \log_a c$ 2) $\log_a b = \log_c b$

3) $\log_a c = \log_b a$ 4) $\log_b a = \log_c b$

48. If $\log a + \log b = \log(a+b)$

then $a =$

1) b 2) $\frac{b}{b-1}$ 3) $\frac{b-1}{b}$ 4) $\frac{b}{b+1}$

49. $5^{2n} - 1$ is divisible by

1) 10 2) 9 3) 20 4) 24

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50. If $x^2 + bx + c = 0$ and

$x^2 + cx + b = 0$,

have a common root

and $b \neq c$ then $b + c =$

1) 0 2) -1 3) 2 4) 1

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51. The value of

$$\sqrt{6+\sqrt{6+\sqrt{6+\ldots}}}$$ is

1) 3 2) 2 3) 4 4) 5

52. If a,b,c are the roots of $x^3 - 6x^2 + 2x - 7 = 0$ then,

$$\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca} =$$

1) $\frac{2}{7}$ 2) $\frac{-7}{2}$ 3) $\frac{6}{7}$ 4) $\frac{-6}{7}$

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53. Remainder when

$x^{55} + x^{24} + 1$ is divided by

$x + 1$ is

1) 0 2) 1 3) 2 4) -1

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54. The domain of $\sqrt{4x-x^2}$ is

1) [0, 4] 2) (0, 4)

3) R-(0,4) 4) R-[0,4]

55. The range of the function

$$f(x)=\frac{x-2}{2-x},\ x\neq 2 \quad \text{is}$$

1)1 2) -1 3) {1} 4){ -1}

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56. The range of the function Sin([x]π), (where [x] is greatest integer function) is

1) 0 2){0} 3)[-1, 1] 4)(0,1)

57. A set A has 6 elements. Then the number of possible relations on A is

1) 6 2) 2^6 3) 2^{36} 4) 6^2

58. The number of functions from a set A containing 7 elements into a set B containing 3 elements is

1) 3 2) 7 3) 3^7 4) 7^3

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59. If $\frac{3x}{(x-6)(x+a)} = \frac{2}{(x-6)} + \frac{1}{x+a}$

then a =

1) 4 2) 3 3) 2 4) 1

60. In the expansion of $(1+x)^{50}$, the sum of the coefficients odd powers of x is

1) 0 2) 2^{50} 3) 2^{49} 4) 2^{51}

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