NUSTRiVE BY NOWSHERWAN

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MATHEMATICS

MCQS GUIDE FOR **NUST | PIEAS | ECAT** AND OTHER STANDARDIZED TESTS

Part 1: 10 Chapters with Answer Key

- Complex numbers
- Matrices
- Vectors
- Sequence and Series
- Miscellaneous topics
- Binomial
- Functions
- Trigonometry
- Application of Trigonometry
- Inverse Trigonometry

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Chapter wise MCQs with NET Past paper MCQs

Chapter - 1

Complex Numbers

1) $i =$

A) $\sqrt{-1}$ B) $(-1)^{\frac{1}{2}}$ C) $\frac{1+i}{1-i}$ D) All

2) $(1+i)^4$

A) $2i$ B) 4 C) -4 D) None

3) $1+i+i^2+i^3+i^4 \ldots\ldots i^{80}$

A) 1 B) 0 C) -1 D) None

4) $i^{-1}+i^{-2}+i^{-3} \ldots\ldots i^{-2021}$

A) 1 B) $-i$ C) -1 D) None

5) $\frac{1+i+i^3+i^5+i^7}{1+i^{20}+i^{22}+i^{24}+i^{26}}$

A) -1 B) 1 C) 2 D) None

6) $(1+i)^2 = x+iy$
then $(x,y) =$

A) $(0,-2)$ B) $(0,2)$ C) $(2,0)$ D) None

7) $z \cdot \bar{z}$

A) $|z|^2$ B) z^2 C) z^3 D) None

8) If $z = x+iy$ then $z+\bar{z}$

A) $2x$ B) $2iy$ C) $2xy$ D) None

9) $(i)^{1.5}$

A) 1 B) -1 C) 10 D) None

10) Which of is true

A) $|z|$ B) $|-\bar{z}| = |z|$ C) $|z| = |\bar{z}|$ D) All

$|z| = |-z|$

11) $\left|\frac{z}{\bar{z}}\right|$

A) 2 B) 1 C) 0 D) None

12) If $z=2$ then $\bar{z}$ is

A) 2 B) -2 C) 2i D) None

13) If $z=3+4i$, find z^{-1}

A) $\frac{3}{25}, \frac{-4i}{25}$ B) $\frac{3}{25}, \frac{4i}{25}$ C) $\frac{4}{25} + \frac{3i}{25}$ D) None

14) $Re(z^{-1})$ if $z = \frac{1}{3+4i}$

A) 4 B) 3 C) 5 D) None

15) $|z+1| = |z-1|$

A) z is purely real B) z is purely imaginary

C) z lies on x-axis D) None

16) Arg of $0+0i$

A) 90° B) 180° C) Undefined D) None

17) Arg (i)

A) -90 B) 90 C) 180 D) None

18) Arg $(1+i)$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) None

19) Principle Argument of a Complex Number lies in

A) $-180 \leftrightarrow 180$ B) $-90 \rightarrow 180$ C) $0 \leftrightarrow 180$ D) None

20) A Complex Number has _____ Argument

A) one B) Two C) Infinite D) None

21) A Complex Number has _____ Principle Arguments

A) One B) Two C) three D) Infinite

22) If $\frac{z_1}{z_2}$ is purely Imaginary, find $\left|\frac{z_1+z_2}{z_1-z_2}\right|$

A) 1 B) 0 C) 2 D) None

23) $(1-i)^4$

A) 4 B) -4 C) 2 D) None

24) $(-i)^{\frac{1}{3}}$

A) $-i$ B) i C) -1 D) None

25) Arg $(|i|)$

A) 1 B) $\frac{\pi}{2}$ C) 0 D) None

26) Arg of $-1+\sqrt{3}i$

A) 120° B) 100° C) 135° D) None

27) Arg of $(-1-i)$

A) $-\frac{2\pi}{3}$ C) $\frac{2\pi}{3}$ C) $-\frac{3\pi}{4}$ D) None

28) Argument of a purely real +ve Complex Number is

A) 0 B) 360 C) 720 D) All

29) Argument of a purely Imaginary # is

A) $\frac{\pi}{2}$ B) $-\frac{\pi}{2}$ C) π D) None

30) If $|z| = 1$ then it represents

A) Ellipse B) Ellipse with eccentricity approaching 0
C) hyperbola D) Parabola

31) $f(x) = i^x$ → Range of $f(x)$ has how many value

A)) B) 4 C) 5 D) None

32) $f(n) = i^n$ → Smallest n before no previous $f(n)$ is repeated

A) 3 B) 4 C) 5 D) None

3) $|(1+i)^{10}|$

A) 32 B) 64 C) 32i D) None

33) $e^{\ln(i)^2} =$

A) 1 B) -1 C) i D) None

34) $\left|\frac{1+i}{1-i}\right| \times \left|\frac{1-i}{1+i}\right|$

A) 1 B) 0 C)) D) None

35) $\frac{|2+i| \times |1-i| \times |4-4i|}{|4+4i| \times |i-2| \times |3+4i|}$

A) $\frac{2}{5}$ B) $\sqrt{\frac{2}{25}}$ C) $\frac{5}{\sqrt{2}}$ D) None

36) for $(k+2)x + (m-n)i$ to be purely Imaginary take $x=1$ →

A) $k=-2$ B) $k=+2$ C) $m=2$ D) $m=n$

36) for Previous question, its purely real if

A) $m=n$ B) $m-n=0$ C) Both D) None

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37) $(1+i)(2-4i)$

A) $-1-2i$ B) $1-3i$ C) $3i-4$ D) None

38) $z + \bar{z} = 0$
then z is

A) Purely real B) Purely imaginary C) Both D) None

39) (r, θ) is

A) Rectangular Coordinate System B) Polar Coordinate System C) Cartesian x Cartesian Coordinate D) None

40) for the Spherical coordinate system, the the third coordinate is

A) ρ(Phi) B) σ C) z D) θ(theta)

41) Arg of $\frac{1+i}{1-i}$

A) 0 B) 2 C) 180 D) None

42) $e^{i\theta}$ =

A) $\cos\theta + i\sin\theta$ B) $\cos\theta - i\sin\theta$ C) $i\cos\theta + \sin\theta$ D) None

43) $e^{i\pi}$ =

A) 1 B) -1 C) 0 D) None

44) $|e^{i\pi}|$

A) 1 B) -1 C) 2 D) None

45) i =

A) $\cos 90 + \sin 90\,(i)$ B) $\cos(270) + i\sin(270)(-1)$
C) $\cos 450 + i\sin 450$ D) All

46) $(1, 30°)$ in Rectangular Coordinate will be

A) $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ B) $\frac{\sqrt{3}}{2} + \frac{i}{2}$ C) Both D) None

47) $1\angle\theta$

(A) z B) $-z$ C) $|z|$ D) None

48) $i\cos\theta + \sin\theta$

A) $e^{i\theta}$ B) $-e^{i\theta}$ C) $e^{-i\theta}$ D) None

49) $\dfrac{\cos 90 + i\sin 90}{\cos 90 - i\sin 90}$

A) -1 B) 1 C) 0 D) None

50) $(\cos\theta + i\sin\theta)^n = \cos n\theta + i\sin(n\theta)$

A) De morgan law B) Brooks Law C) Demoi'ver's Law
D) Demoiver's theorem

51) Write $1+i$ in polar form

A) $\sqrt{2}\left(\cos\left(\frac{\pi}{4}\right) + i\sin\left(\frac{\pi}{4}\right)\right)$ B) $\sqrt{3}(\cos 360 + i\sin 90)$

C) $\sqrt{2}(\cos(405^\circ) + i\sin(405^\circ))$ D) Both A / C

52) $(\cos(\theta) + i\sin(\theta))^n$ where $\theta = 90$ and $n = 10$

A) $(0,-1)$ B) $(-1,0)$ C) $(0,1)$ D) None

53) $z_1 = |r_1| e^{i\theta_1}$, $z_2 = |r_2| e^{i\theta_2}$

then $\frac{z_1}{z_2}$ Modulus are

A) Multiplied B) Divided C) Added D) None

54) If $z_1 = |r_1| e^{i\theta_1}$ and $z_2 = |r_2| e^{i\theta_2}$

Arguments of $z_1 \cdot z_2$ are

A) Multiplied B) Added C) Subtracted D) None

55) $\cos\theta - i\sin\theta =$

A) $e^{i\theta}$ B) $e^{-i\theta}$ C) $|e^{i\theta}|$ D) None

56) Argument of $\cos\theta - i\sin\theta$

A) θ B) $-\theta$ C) $|\theta|$ D) None

57) If $\arg(z)^4 = \pi$ then Principle $\arg$ of $(z)^4$ or $\arg(z)^4$

A) 0 B) 2π C) 4π D) None

58) $(\cos\theta + i\sin\theta)^n$ where θ is 90 and $n = 12 \rightarrow$ is equal to $x+iy$ then $\frac{x}{y}$

A) 0 B) 1 C) Undefined D) None

59) for Complex Numbers z_1 and z_2

A) $|z_1+z_2| > |z_1| + |z_2|$ B) $|z_1| + |z_2| \leq |z_1| - |z_2|$

C) $||z_1| - |z_2|| > |z_1| + |z_2|$ D) None

60) If $z_1 = 3$ and $z_2 = 3+4i$ then ratio of max value of $|z_1+z_2|$ to Minimum (Minimum) value is

A) $\frac{3}{5}$ B) $\frac{5}{3}$ C) $\frac{4}{2}$ D) None

61) If $z^2 = 3+4i$ then $z =$

A) $2+i$ B) $2-i$ C) $\pm(2-i)$ D) $\pm(2+i)$

62) $z + \frac{1}{z} = 2$ has

A) Real roots B) Imaginary roots C) Distinct real roots D) None

63) $z + \frac{2}{z} = 2$

A) $z = 1+i$ B) $z = -1+i$ C) $z = +i$ D) None

64) $\sum_{n=0}^{4} i^n + \sum_{n=1}^{4} -i^n$

A) $1+i$ B) $-1-i$ C) $1-2i$ D) None

65) $x^2+3 =$

A) $(x+i\sqrt{3})(x-i\sqrt{3})$ B) $(x+3i)(x-3i)$

C) $(x+i\sqrt{3})(x+\sqrt{3}i)$ D) All

66) $3i > \text{or} < 4i$

A) $>$ B) $<$ C) $=$ D) None

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67) Polar form of $(1-3i)^{-1}$

A) $\left(\frac{1}{10}, \frac{3}{10}\right)$ B) $\left(\frac{-1}{10}, \frac{2}{10}\right)$ C) $\frac{1}{10} \frac{+3i}{10}$ D) Both A/C

68) Complex Numbers are represented on

A) Argand Plane B) Gauss Plane C) Planks Plane D) Cartesian Plane

69) $\left(\frac{1+i}{\sqrt{2}}\right)^8$

A) -1 B) (1,0) C) (0,-1) D) None

70) $\left| \frac{1+i}{1-i} - \frac{1-i}{1+i} \right|$

A) (0,3) C) 2 C) 1 D) None

71) $\left(\frac{1+i}{1-i}\right)^m = 1$ → least +ve integer m is

A) 2 B) 1 C) 3 D) 4

72) $\frac{i^{4k} - i^{4k-1}}{i^{4k}}$

A) $1+i(2)$ B) $1-i$ C) $\sqrt{2}\left(\cos\frac{\pi}{4} + i\sin\frac{\pi}{4}\right)$ D) None

73) Mirror Image of $1-i$ is

A) $-1+i$ B) $-1-i$ C) $i+1$ D) None

74) If i and ki are reciprocal of one another then $k=$

A) 1 B) -1 C) 0 D) None

75) $\left(\frac{z+\bar{z}}{2}\right)^4$ if $z = 2+2i$

A) 16 B) 18 C) 20 D) None

76) $\bar{I}m(z) =$

A) $\frac{z-\bar{z}}{2i}$ B) $\frac{z-\bar{z}}{2}$ C) $\frac{z+\bar{z}}{2}$ D) None

77) If $z = 1-i$ and $1-i = \frac{1}{i}$

Then $z =$

A) 0 B) 1 C) 2 D) None

78) If $\bar{z} = -z$ then z is

A) purely real B) real Imaginary C) Both purely real and purely imaginary D) None

79) $\sqrt{-3} \cdot \sqrt{-4} =$

A) $-\sqrt{12}$ B) $\sqrt{12}$ C) $\sqrt{12}i$ D) None

80) $\sqrt{-3} \cdot \sqrt{4}$

A) $\sqrt{12}i$ B) $-\sqrt{12}$ C) $\sqrt{12}$ D) None

81) Multiplicative identity of Complex # is

A) $(0,-1)$ B) $(1,0)$ C) $(0,0)$ D) None

(82)

$Arg(z) = Arg(-z)$

A) Possible C) Not possible C) Both? D) None

83) $\bar{I}m(iz) = Re(z)$

A) True B) False C) Partially true D) None

84) If $z_1 = 1+3i$ and $z_2 = 2+2i$ then $Re(iz_1 z_2)$

A) 1 B) -1 C) i D) None

85) If $\bar{z} = \frac{-i}{1+i}$ then $z =$

A) $\frac{1+i}{2}$ B) $\frac{-1+i}{2}$ C) $\frac{1-i}{2}$ D) None

86) $\left(\frac{\bar{z}}{i}\right)$ or $\overline{\left(\frac{z}{i}\right)} =$

A) $\bar{z}$ B) $i.\bar{z}$ C) $-\bar{z}$ D) None

87) let $z = \frac{-1}{2} - \frac{\sqrt{3}}{2}i$ then $z + \bar{z} - 1 =$

A) 0 B) i C) 1 D) -2

88) let $z \neq 0$ and $\bar{z} = z^{-1}$ - WOF is true

A) $|z| = 1$ B) $|\bar{z}| = 1$ C) $|z^{-1}| = 1$ D) All

89) for uni Modular z, $|z| =$

A) 1 B) 0 C) 2 D) None

90) $e^{\ln i}$

A) $\sqrt{-1}$ B) -1 C) 1 D) None

91) If $z = 3+4$ then $|z|$

A) 7 B) 5 C) 2 D) None

92) If $z = 3-4$ then $\bar{z}$

A) $3+4i$ B) $3+4$ C) -1 D) None

93) $(i)^i =$

A) $\frac{1}{\sqrt{e^{\pi}}}$ B) $e^{\frac{-\pi}{2}}$ C) Both D) None

94) Difference by 3i and 1+3i

A) First is Complex #, second is Img # B) Vice versa of A

C) Both D) None

95) Every Complex # is Imaginary # but Every Img # is not Complex #

A) True B) False C) Both D) None

96) Complex # Set is _____ of Real # Set

A) Subset B) Supper Set C) Power Set D) None

97) |3i|

A) 3 B) 1 C) 10 D) None

98) $\sqrt{(x+yi)^2}$ = where $x+iy = z$

A) $\sqrt{(Re)^2+(Im)^2}$ B) $\sqrt{(Re(z))^2+(Im(z))^2}$ C) $(Re)^2+Im(z)^2$

D) None

99) $\arg(-1-\sqrt{3}i)$

A) $\frac{\pi}{6}$ B) $\frac{-2\pi}{3}$ C) $\frac{\pi}{3}$ D) None

100) if x is a real # then wof is never true

A) $x \geq 0$ B) $x < 0$ C) $x^2 \geq 0$ D) $x^2 < 0$

Solutions Seperate PDF

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MATRICES

i) Rectangular Array of Numbers / Elements is

A) Matrix B) 5-D Vectors C) Scalars
D) None

) $[a_1 \; a_2]$ a_1, a_2 are

A) Elements B) Entries C) Both D) None

) $\begin{bmatrix} a_3 & a_7 \\ a_{21} & a_2 \end{bmatrix}$ and $\begin{bmatrix} a_3 & a_4 \\ a_{18} & a_{20} \end{bmatrix}$

Corresponding entries / Elements are

A) a_{21} and a_{14} B) a_8 and a_4

) a_{21} and a_3 D) None

3) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ are

A) Equal Matrices B) Unequal Matrice

C) Square Matrices D) Both A/C

4) if $\begin{bmatrix} -1 & x^2 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} -1 & -1 \\ 2 & 1 \end{bmatrix}$ where $x \in R$

then $x =$

A) $\pm i$ B) ± 1 C) 0 D) None

5) $\begin{bmatrix} 5 \end{bmatrix}$ is

A) Square Matrix B) Scalar Matrix C) Both row / Col Matrix D) All

6) $\begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$ → M.D (Main Diagonal) is

A) a, e, i B) a, b, c C) d, g, h D) None

7) $\begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix}$ $a_{22} - a_{11} =$

A) 6 B) 5 C) 1 D) None

8) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is

A) Diagonal Matrix B) Upper triangular

C) Lower Triangle D) All

9) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

A) Scalar B) Identity C) Both D) None

10)

Addition of Matrices is valid if (order o(A) for Matrix A and o(B) for matrix B)

A) $o(A) = o(B)$

D) None

B) $O(A) \neq O(B)$

C) $(O(A))^T = |O(A)|$

11) Add $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 2 \end{bmatrix}$

A) $\begin{bmatrix} 3 & 2 \\ 3 & 4 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 4 \\ 3 & 4 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 2 \\ 5 & 4 \end{bmatrix}$ D) None

12) Number of elements in 1x12 matrix is

A) 12 B) 6 C) 8 D) None

13) A matrix has 12 Elements, All possible order of matrices can be

A) 6 B) 5 C) 4 D) None

14) A 2×2 Matrix whose elements are given by $a_{ij} = i+j$ is

A) $\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 3 \\ 9 & 10 \end{bmatrix}$ C) $\begin{bmatrix} 10 & 20 \\ 30 & 1 \end{bmatrix}$ D) None

15) for diagonal matrix $a_{ij} \neq 0$ for

A) $i \neq j$ B) $i < j$ C) $i = j$ D) None

16) If $a_{ij} = a_{ji}$ then

A) $A^t = A$ B) $A^t = -A$ C) Both D) None

17) For skew symmetric Matrix, $a_{ij} = 0$ for

A) $i = j$ B) $i \neq j$ C) $i < j$ D) None

18) A Matrix of odd order and having $a_{ij} = 0$ for all $i = j$ and $a_{ij} = -a_{ji}$ for $i \neq 0$ has determinant

A) 1 B) 0 C) 2 D) None

19) Determinant of Diagonal Matrix

A) Product of M.D Element B) Product of Non M.D

C) Both D) None

20) Zero matrix is

A) Skew symmetric B) Symmetric C) Both D) None

21) Det of $\begin{bmatrix} 1 & a^2 & a^3 \\ a^4 & a^5 & a^{20} \end{bmatrix}$

A) a^{30} B) a^{20} C) a^{10} D) None

22) A is square matrix then $A+A^T$ is

A) Symmetric B) Skew Symmetric C) Both D) None

23) Cancellation law holds in Matrix addition

A) Yes B) No C) Partially True D) None

24) Generally $AB=BA$

A) True B) False C) Both D) None

25) Matrix multiplication is

A) Associative B) Additive C) Distributive D) None

26) I is Identity matrix, then $(I)^{20}$

A) $2I$ B) I C) $3I$ D) None

27) $2\times3 \,/\, 3\times5$ → resultant matrix order

A) 5×2 B) 2×3 C) 2×5 D) None

28) $\begin{bmatrix}1 & 3\\ -1 & 5\end{bmatrix}\times\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}\times\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}\times\begin{bmatrix}1 & 1\\ 1 & 1\end{bmatrix}$

A) $\begin{bmatrix}4 & 4\\ 9 & 9\end{bmatrix}$ B) $\begin{bmatrix}1 & 3\\ 5 & 9\end{bmatrix}$ C) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ D) None

29) If A is Symmetric and B is Skew Symmetric then $(AB)^T$

A) BA B) B^TA C) $-BA$ D) None

30) A Matrix A with Complex Entries is Called

A) Hermitian Matrix B) Skew hermitian C) Scalar D) None

31) $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ is

A) Scalar B) Diagonal C) Identity D) None

32) Determinant of $[5]$

A) 5 B) Undefined C) 1 D) None

33) $A_{ij} = C_{ij}$

A) $(-1)^{i+j} A_{ij}$ B) $(-1)^{i+j} M_{ij}$ C) $(-1)^{i-1} M_{ij}$ D) None

34) If i+j is odd then C_{ij}

A) M_{ij} B) $-M_{ij}$ C) 0 D) None

35) Determinant of $\begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$

A) 1 B) 0 C) 2 D) None

36) Det of $\begin{vmatrix} 1 & 3 & 5 \\ 7 & 8 & 9 \\ 2 & 1 & 3 \end{vmatrix}$ is k then det of $\begin{vmatrix} 7 & 8 & 9 \\ 1 & 3 & 5 \\ 2 & 1 & 3 \end{vmatrix}$ is

A) -k B) k C) 2 D) None

37) A square matrix is only invertible if it is

A) Singular B) Non Singular C) Both D) None

38) $\begin{vmatrix} 1 & 3 & 5 \\ 2 & x & 10 \\ 3 & 1 & 5 \end{vmatrix} = 0$, find x

A) 6 B) 21 C) 32 D) None

39) $A = \begin{bmatrix} 1 & 3 \\ 5 & 1 \end{bmatrix}$ then $(A^{-1})^{-1} =$

A) A^{-1} B) A C) $\frac{1}{|A|}$ D) None

40) If $(kA)^{-1} =$

A) $k^{-1}A^{-1}$ B) kA^{-1} C) kA D) None

41) $(A^n)^{-1} = (A^{-1})^n$

A) True B) False C) Both D) None

42) $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 1 \\ 2 & 4 & 6 \end{bmatrix}$ then $|A^{-1}|$

A) Undefined B) Defined C) 1 D) None

43) If a Matrix is Singular, then

A) $(A^{-1})^{-1} = A$ B) $(A^{-1})^T = (A^T)^{-1}$ C) $(kA)^{-1} = k^{-1}A^{-1}$ D) None

44) $adj(adj A) = |A|^{n-2} A$ where n is non singular Matrix

A) Correct B) Partially Correct C) Wrong D) None

45) If $AB = BA = I$ then A, B are

A) Inverses B) Additive C) Distributive D) None

46) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then $|A^{10}|$

A) 2^{10} B) -2^{10} C) 10240 D) None

47) If Elements of one row or col is multiplied with Cofactors of another, their Sum is

A) 0 B) Det(A) C) Undefined D) None

48) If Elements of one row/col is multiplied with Cofactors of same row/col, their Sum is

A) 0 B) Determinant C) 2 D) None

49) $\begin{vmatrix} 1 & 3 & 4 & 5 \\ 2 & 1 & 3 & 4 \\ 1 & 3 & 4 & 2 \\ 2 & 6 & 8 & 10 \end{vmatrix}$ → det is

A) A B) 0 C) 1 D) 32

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50) $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 1 \\ K_2 & K-1 & m \end{bmatrix}$ for what value of ~~K_1, K_2~~

Suppose $m=1$

the Matrix has rank 0

A) 1,0 B) 2,0 C) 3,0 D) None

51) $(ABC^{-1})^{-1}$

A) $CB^{-1}A^{-1}$ B) $A^{-1}BC$ C) CBA^{-1} D) None

52) $\det(A^{-1}) = 5$ then $\det(A)$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{5}$ D) None

53) homogenous system of equations is always

A) Consistent B) Inconsistent C) Both D) None

54) $3x+4y+5z=0$

$6x+8y+10z=0$

$9x+12y+15z=0$

x, y, z

A) (0,0,0) B) Infinite Solutions C) 2,3,1 D) None

55) Rank of I^5 where I is Identity matrix

A) 2 B) 0 C) 5 D) None

56) $x+y+z=0$, $-x+y+z=0$, $-x+5y+z=0$ has

A) Trivial Sol B) Non trivial Sol C) Infinite Sol

D) Both B/C

57) $B-B^t$ is

A) Symmetric B) Skew Symmetric C) Identity D) None

58) $A=\begin{bmatrix} 2 & 9 & 8 \\ 0 & 5 & 7 \\ 0 & 0 & 3 \end{bmatrix}$ $\det(3A)$

A) 0 B) 810 C) 270 D) None

59) If $2A+3B=\begin{bmatrix}2 & -1 & 4\\ 3 & 2 & 5\end{bmatrix}$ and $A+2B=\begin{bmatrix}5 & 0 & 3\\ 1 & 6 & 2\end{bmatrix}$

then B=

A) $\begin{bmatrix}8 & 1 & 2\\ 1 & 10 & 1\end{bmatrix}$ B) $\begin{bmatrix}8 & -1 & 2\\ -1 & 10 & -1\end{bmatrix}$ C) $\begin{bmatrix}1 & 3\\ 2 & -1\end{bmatrix}$ D) None

60) $\begin{bmatrix}a & 2 & -3\\ b & c & 5\\ d & e & f\end{bmatrix}$ is skew Symmetric then a+b+c+d+e+f=

A) -4 B) 0 C) 2 D) None

61) if $\begin{bmatrix}2 & 4x+5\\ x-2 & 3\end{bmatrix}$ is symmetric, then x=

A) $-\frac{3}{5}$ B) $\frac{5}{3}$ C) 5 D) None

62) ~~det~~ Adjoint of 3x3 Matrix is Transpose of Cofactors of the 3x3 Matrix

A) Yes B) No C) Partial Yes D) None

63) $\begin{vmatrix} 0 & k & 0 \\ -k & 0 & k \\ 0 & k & -1 \end{vmatrix} = 0$, then $k =$

A) 0 B) 1 C) 2 D) None.

64) If w and w^2 are complex roots of unity then inverse of which of the following exist

A) $\begin{bmatrix} 1 & w \\ w & w^2 \end{bmatrix}$ B) $\begin{bmatrix} w^2 & 1 \\ 1 & w \end{bmatrix}$

C) $\begin{bmatrix} w & w^2 \\ w^2 & 1 \end{bmatrix}$ D) None

65) $\left[(ABC)^{-1}\right]^t =$

A) $(A^{-1})^t \cdot (B^{-1})^t \cdot (C^{-1})^t$ B) $(A^t)^{-1} (B^t)^{-1} (C^t)^{-1}$

C) $(A^t)^{-1} (B^{-1})^t (C^{t-1})$ D) All

66) let A be non Singular matrix of order 4x4
then |adj A| .

A) |A| B) $|A|^3$ C) 4|A| D) None

67)
$$\begin{vmatrix} x-y & y-z & z-x \\ y-z & z-x & x-y \\ z-x & x-y & y-z \end{vmatrix} =$$

A) xyz B) 0 C) (x-y)(y-z)(x-z) D) None

68) $2x+y=5$, $x+3y=5$, $x-2y=0$

A) No Sol B) Unique Sol C) Two Sol D) Infinite ~~Zero~~

69) $AX=B$ → System of linear Equation is homogenous if

A) A=0 B) X=0 C) B=0 D) None

70) In Gauss Jordan Elimination, Augmented matrix $AX = B$ is Converted to

A) Reduced echelon B) Canonical form C) Echelon D) None

71) Transpose of rectangular Matrix is

A) Square B) Rectangular C) Scalar D) None

72) If A is Non Singular then A is

A) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ B) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ C) $\begin{bmatrix} 4 & 6 \\ 2 & 3 \end{bmatrix}$ D) $\begin{bmatrix} 3 & 0 \\ 1 & 0 \end{bmatrix}$

73) $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ then $\det(A^2 - B^2)$

A) 0 B) 1 C) 2 D) None

74) $\begin{vmatrix} q^2 & 0 & 0 & 0 \\ 0 & q^4 & 0 & 0 \\ 0 & 0 & q^6 & 0 \\ 0 & 0 & 0 & q^8 \end{vmatrix}^n = q^{15}$

$n = ?$

A) 1 B) 2 C) $\frac{1}{2}$ D) None

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75) $\det(AB^3) = 40$, $\det(B) = 10$, Find $\det(AB)$

A) 0.4 B) 0.5 C) 0.6 D) None

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1) which of the following has no meaning for the vector a

A) $\vec{a}=2i$ B) $|\vec{a}|<0$ C) $|\vec{a}|>0$ D) None

2) If a is a vector then $k\vec{a}$ if k is scalar and negative then $\vec{a}$ and $k\vec{a}$ are

A) Same direction B) opposite direction C) Perpendicular D) None

3) $a=3i$ an, and $b=-3i$ are

A) unlike vectors B) antiparallel C) parallel D) Both A/B

4) If $b=[1,2]$, $c=[2,3]$ and $a=[-1,3]$

then $\vec{a}=-3\vec{b}+\vec{c}$ is

A) Linear Combination B) Non linear Combination
C) Consistent D) None

5) Collinear vectors $2i$ and i are

A) Linearly dependent B) Linearly independent

C) Neither D) None

6) $\vec{a} = i - 3j + k$, $\vec{b} = -2i + 6j - 2k$ are

A) Linearly dependent B) Linearly independent

C) Neither D) None

7) $\vec{a}$ and $k\vec{a}$ are always collinear, except for what value of k

A) 1 B) -1 C) 0 D) Non

8) Non Collinear vectors are linearly independent if a, b are non collinear vectors and $p\vec{a} + q\vec{b} = \vec{0}$ if

A) $p=0, q=0$ B) $p=q=0$ C) ~~$p \neq q$~~ $p=q \neq 0$ D) None

9) if there are three vectors and one can be written in linear ~~combinati~~ Combination of the other two, then vectors are

A) Non Coplanar B) Coplanar C) Vertical D) None

10) three Coplanar vectors are

A) Linearly dependent B) Linearly independent
C) Non Linearly dependent D) None

11) $3i+4j-5k$, $ai+8j-10k$ and $4i-2j+k$ are

A) Coplanar vectors for a=6 B) Non Coplanar for a=3
C) Coplanar for a=2 D) Both A/B

12) Position vectors are

A) Fixed vector B) Localized vector C) Non Localized
D) A/B

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13) A vector terminates at P (1,2) and started from O then O is

A) (0,0) B) (1,2) C) Cant be determined D) None

14) the vector $\frac{\vec{a}}{|\vec{a}|^2}$ for the vector $\vec{a}$, they are relation b/w $\vec{a}$ and $\frac{\vec{a}}{|a|^2}$

A) Reciprocal B) Localized C) Non linearly Dependent D) None

15) The vector $\overrightarrow{AB}$ is

A) Position vector of B - Position vector of A
B) Vector B - Vector A
C) Pos vector of B - Vector A
D) None

16) The additive identity of vectors is

A) Non Null vector B) Null vector C) Dependent D) None

17) The unit vector $\vec{a}+\vec{b}+\vec{c}$ is

A) $\frac{a+b+c}{|a+b+c|^2}$ B) $\frac{\vec{a}+\vec{b}+\vec{c}}{|a+b+c|}$ C) $\frac{(\vec{a}+\vec{b}+\vec{c})^2}{|a+b+c|}$ D) None

18) Wof is true

A) $|\vec{a}+\vec{b}| > |\vec{a}|+|\vec{b}|$ B) $|\vec{a}+\vec{b}| \leq |\vec{a}|+|\vec{b}|$

C) $|\vec{a}+\vec{b}| < |\vec{a}|+|\vec{b}|$ D) None

19) The vector $i+j$ makes what angle with z axis

A) 45 B) -45 C) 90 D) None

20) The vector $i+\sqrt{3}j$ makes what angle with y axis

A) 45 B) 60 C) 30 D) None

21) If α, β, γ are direction angle of γ then $\cos^2\alpha+\cos^2\beta+\cos^2\gamma =$

A) 1 B) 2 C) 3 D) None

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22) $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

A) 1 B) 2 C) 0 D) None

23) The vectors modulus is the projection on

A) itself B) other vectors C) only if $\theta = 45$ D) None

24) if $\vec{a} = 0, \vec{b} \neq 0$ and $\vec{a} \cdot \vec{b} = 0$ then θ is

A) $\theta = 45$ B) $\theta = 90$ C) $\theta = 180$ D) Not defined

25) $\vec{a} \cdot \vec{b}$ is

A) Vector B) Scalar C) Tensor D) None

26) Scalar product is

A) Distributive B) Additive C) Inverse D) None

27) for any obtuse angle $\vec{a} \cdot \vec{b}$ is

A) >0 B) <0 C) =0 D) None

28) for what value of θ, $\vec{a} \cdot \vec{b}$ is half of its maximum

A) 30 B) 45 C) 60 D) None

29) $(i \cdot j) + (j \cdot k) + (i \cdot j) + (i \cdot j)^2 + (i \cdot i)^2$

A) 1 B) 2 C) -1 D) None

30) The vectors are perpendicular for what value of m

$a = 3i - 6j + 6k$, $b = mi - 12j + 12k$

A) 2 B) 6 C) 8 D) None

31) The vectors $i - j + k$ and $-i + j - k$ are

A) Parallel B) Anti parallel C) Perpendicular

D) None

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32) $2i-3j+4k$ and $mi-6j+8k$ are parallel for

A) $m=3$ B) $m=4$ C) $m=-4$ D) None

33) $(\vec{a}\cdot\vec{b})^2 =$

A) a^2b^2 B) $a^2b^2-(a\times b)^2$ C) $(a\times b)^2-a^2b^2$ D) None

34) $a\cdot b = a\times b$ for θ

A) $=0$ B) $=90$ C) $=1$ D) None

35) $|a+b|$ and $|a-b|$ are equal at $\theta =$

A) Parallel at $\theta=0$ B) $\theta=90$ C) $\theta=45$ D) None

36) $|\vec{a}+\vec{b}|=1$ and $\vec{a}, \vec{b}$ are unit vectors then $\theta =$

A) 90 B) 120 C) 45 D) None

37) for $a \times b = ab\sin\theta$, θ is

A) $0 < \theta < \pi$ B) $0 \leq \theta \leq \pi$ C) $0 < \theta < \pi$
D) None

38) $(i \cdot j) \times (j \times i)$

A) 0 B) 1 C) $i-j$ D) None

39) $|a \times b|$ is (a, b are vectors)

A) $\geq |a \cdot b|$ B) $< |a \cdot b|$ C) $\leq |a| \cdot |b|$ D) None

40) $(i \cdot j \times k)^{11}$

A) 1 B) -1 C) 0 D) None

41) $a \times b$ is only defined if a, b are

A) 2-D B) 1-D C) 3-D D) None

42) $\vec{a} = i-j+k$ and $\vec{b} = 3i-2j+k$
then $a \times b$

A) $1-2j+3k$ B) $4i-2j+k$ C) $3i-2j+k$ D) None

43) $|a \times b|^2 + (a \cdot b)^2 =$

A) $|a|^2|b|^2$ B) $|a||b|^2$ C) $(ab)^3$ D) None

44) ABCD with Diagonals $\vec{AC}$ and $\vec{BD}$

$AC = i+j$ and $BD = 2i-j$

then Area of Quadrilateral ABCD

A) 3 B) 2.5 C) 1.2 D) None

45) Ratio of Area of Rectangle and triangle made by Adjacent side vectors $\vec{a}$ and $\vec{b}$ is

A) 1:3 B) 3:1 C) 2:1 D) None

46) $\cos\theta i + \sin\theta j$ is

A) Radial vector B) unit vector C) localized D) None

47) $a \cdot b \times c =$

A) $b \cdot c \times a$ B) $c \cdot a \times b$ C) Both D) None

48) $\vec{a} = 3i+4j-k$ $\vec{b} = i-j+k$ and $c = 2i-2j+2k$
find $c \cdot a \times b$

A) 1 B) 0 C) 2 D) None

49) find work done in moving an object along $9i-j+k$ and force is $3i+2j+k$

A) 25 B) 26 C) 23 D) None

50) if for vectors a, b, c $a \cdot (b+c) = b(a-c)$

A) $c \cdot (a+b) = 0$ B) $c \times (a \cdot b) = 0$ C) $c \cdot (a-b) = 0$

D) None

51) if $|\vec{A}| = |\vec{B}|$ then angle b/w $\vec{A}+\vec{B}$ and $\vec{A}-\vec{B}$

A) 0 B) 90 C) 180 D) None

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52) Perimeter of Triangle made by (2,2,0) B) (-1,0,2) and C (0,4,3)

A) 21 B) 31 C) 41 D) None

53) Moment of a force i+j+k at a point (1,2,3) about origin

A) -i+2j+k B) -i+2j-k C) i-2j+k D) None

54) unit vector ⊥ to a=i-2j+k and b=-i-j+2k

55) how many Components Can a vector have

A) 3 B) 2 C) 1 D) None

56) how many diff unit vectors can be ⊥ to (i-j)x(4i+j)

A) 1 B) 3 C) 2 D) None

57) $OP = 3a - 2b + c$ and $OQ = a + 4b - c$ then Mid point of PQ

A) $\frac{a+b}{2}$ B) $\frac{a+4b-2c}{3}$ C) $2a - \frac{1}{2}b - 2c$ D) $2a+b$

58) value of $i \cdot (j \times k) + j \cdot (i \times k) + k \cdot (i \times j)$

A) 1 B) -1 C) 0 D) 3

59) Volume of tetrahedron with Coterminous edges $a = i + 2k$, $b = 4i + 6j + 2k$, $c = 3i + 3j - 6k$

A) 9 B) 6 C) $5\sqrt{4}$ D) None

60) A vector of Magnitude 10 is added to a vector of Magnitude $2\sqrt{5}$ the Magnitude of Sum might be

A) Zero B) 3 C) 12 D) 47

61) Vector of magnitude $\frac{1}{\sqrt{6}}$ units in direction of $i + 2j - k$ is

A) $\frac{1}{\sqrt{6}}i + \frac{2}{\sqrt{6}}j - \frac{1}{\sqrt{6}}k$ B) $\frac{1}{6}i + \frac{1}{3}j - \frac{1}{6}k$ C) $\frac{1}{6}i + \frac{1}{6}j - \frac{1}{6}k$ D) None

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Sequence and Series

1) 0, 3, 2 are first three terms of

A) $n-(-1)^{n^2}$ B) $n+(-1)^n$ C) $n^2-(1)^{n^2}$ D) None

2) Infinite Sequence has

A) Finite terms B) Finite Domain C) Infinite Domain D) None

3) Fifth term of Fibonacci Sequence is

A) 5 B) 3 C) 1 D) None

4) 6th term of Triangular Sequence is

A) 22 B) 21 C) 20 D) None

5) Find first four terms of sequence whoose first term is 1 and whoose $(n+1)^{th}$ term is obtained by subtracting n from its n^{th} term

A) 1, 0, -2, -5 B) -1, 0, 3, 2 C) 1, 2, 3, 4 D) None

6) Common difference can be

A) +ve B) -ve C) 0 D) All

7) 2, 2, 2 ... is

A) A.P B) Constant G.P C) Both D) None

8) for an a.p, $a_5 - a_3$

A) d B) $\frac{d}{2}$ C) 2d D) None

9) which of the following is true for A.P

A) $a_6 - a_4 = 2d$ B) $a_5 - a_2 = a_7 - a_4$

C) $a_5 - a_2 = a_{11} - a_8$ D) All

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10) If $\frac{1}{a}, \frac{1}{b}$ and $\frac{1}{c}$ are in A.P then d=

A) $\frac{a-b}{ab}$ B) $\frac{b-c}{bc}$ C) Both D) None

11) If $-x^2, x, x^2+1$ form A.P, x=

A) $\frac{1}{3}$ B) 0 C) $\frac{1}{2}$ D) None

12) WOF is true

A) $\frac{a_4-a_1}{3}=d$ B) $\frac{a_4-a_1}{4}=d$ C) $\frac{a_5-a_2}{4}=d$

A) None

13) 0, 1, 2, 3, 4, 5 ... 32, find Number of Terms

A) 32 B) 31 C) 33 D) None

14) Find 11th term of A.P, whoose first term is 2 and common difference is -3

A) -2 B) -28 C) 31 D) None

15) If fifth term of A.P is 13 and 17th term is 49, find a_{13}

A) 31 B) 37 C) 41 D) None

16) n^{th} term of $\left(\frac{4}{3}\right)^2, \left(\frac{7}{3}\right)^2, \left(\frac{10}{3}\right)^2$

A) $\frac{(3n+1)^2}{(3)^2}$ B) $\frac{(n-2)^2}{9n}$ C) $\frac{(n+1)^3}{3n}$ D) None.

17) Which term out of three Consecutive terms in A.P is the Arithmatic Mean

A) First B) last C) Middle D) None

18) Find three arithmatic means b/w $\sqrt{2}, 3\sqrt{2}$ and mention the 2nd one

A) $2\sqrt{2}$ B) $\frac{2}{\sqrt{2}}$ C) $\sqrt{12}$ D) None

19) Find n so that $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is A.M b/w a & b

A) 1 B) 2 C) 0 D) None

20) Sum of Seven arithmetic means b/w 2 and 12

A) 20 B) 22 C) 28 D) None

21) Sum of $2+4+6 \cdots 100$

A) 225 B) 2525 C) 2100 D) None

22) n^{th} term of S_n for $1, 3, 5 \cdots$

A) n^2 B) $(n+3)^2$ C) $(n+1)^2$ D) None

23) Sum of $1^2, 2^2, 3^2 \cdots$

A) $\frac{n(n+1)}{2}$ B) n^2+n C) $\frac{n(n+1)(2n+1)}{6}$ D) $\left(\frac{n(n+1)}{2}\right)^2$

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24) Sum of Ap is Given by

A) $\frac{n}{2}(a+tan)$ B) $\frac{n}{2}(2a+(n-1)d)$ C) Both D) None

25) If the Series $-9, -6, -3, 0$ Sum upto 66 then number of terms are

A) -4 B) 11 C) 12 D) None

26) If $S_n = n^2$, find a_5

A) 9 B) 16 C) 25 D) None

27) Nth term of summation for AP is ____ in n

A) Linear B) Quadratic C) Cubic D) None

28) nth term of A.P is _____ in n

A) Linear B) Quadratic C) Cubic D) None

29) Sum of the series $(1+2)+(1+2+2^2)+(1+2+2^2+2^3)+\cdots$

A) $2^{n+2}-n$ B) $2^{n+2}-n-4$ C) $2^{n+1}-n$ D) None

30) If a, b, c form A.P then

$\frac{2a+2}{2}, \frac{2b+2}{2}, \frac{2c+2}{2}$ form

A) A.P B) G.P C) H.P D) None

31) For an A.P if $S_{2n}=3S_n$ then

A) $S_{36n}=35n$ B) $S_{3n}=6Sn$ C) $45_n=8_{3n}$

D) None

32) Sum of first 100 Natural #s that are divisible by 2 or 5 are

A) 3550 B) 3150 C) 3360 D) None

33) If Sum of 3 Numbers in A.P is 9 and Sum of their squares is 30 then $\frac{a_1}{d}$ is

A) $\frac{3\sqrt{2}}{\sqrt{3}}$ B) $\frac{3}{2\sqrt{3}}$ C) $\frac{1}{2\sqrt{3}}$ D) None

34) For a G.P, $\frac{a_4}{a_1}$

A) r^2, B) r^3 C) r^4 D) None

35) WOF Cant be a term of G.P

A) 1 B) 0 C) 2 D) None

36) Reciprocal of G.P is

A) A.P B) G.P C) A.P D) None

37) If Common ratio of a, b, c is a^n then r of $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ is

A) a^n B) a^n C) a^2 D) None

38) Sequence $a_n = 3(2)^n$ is

A) A.P B) G.P C) H.P D) None

39) If $x-7, x, x+8$ form G.P then $x =$

A) 56 B) 58 C) 60 D) None

40) Find an for G.P if $a_4 = \frac{8}{27}$ and $a_7 = \frac{-64}{729}$

A) A) $(-1)^n \left(\frac{2}{3}\right)^{n-1}$ B) $(-1)^n \left(\frac{3}{2}\right)^{n-1}$ C) $\frac{(n)^2}{3n-1}$ D) None

41) G.M b/w $x+y$ and $x-y$

A) $\sqrt{x^2+y^2}$ B) $\sqrt{x^2-y^2}$ C) $\sqrt{x^2-1}$ D) None

42) If a, b, c are 7th, 9th and 16th term of a G.P respectively then

A) $a^3 = b^2c$ B) $c^3 = a^2b$ C) $a^3 = bc^2$ D) $b^3 = ac^2$

43) G.M b/w 4 and 16

A) 8 B) -8 C) Both D) None

44) G.M b/w -4 and -16

A) 8 B) -8 C) Both D) None

45) G.M b/w 4 and -16

A) 8i B) -8i C) Both D) None

46) $\frac{a^n + b^n}{a^{n-1} + b^{n-1}}$ is G.M b/w a, b for n=

A) 0 B) 1 C) 2 D) $\frac{1}{2}$

47) Sum of G.P if $|r| > 1$

A) $\frac{a(r^n - 1)}{r-1}$ B) $\frac{a(1-r^n)}{1-r}$ C) Both D) None

48) Sum of 2+4+8 --- 64

A) 124 B) 125 C) 126 D) None

49) 2+4+8+16 --- n --- ∞

A) 2020 B) n^2+n C) ∞ D) None

50) $1 + \frac{1}{2} + \frac{1}{4} + \cdots \infty$

A) 1 B) $\frac{1}{2}$ C) 2 D) None

51) Sum of $2 - \frac{1}{2} + \frac{1}{8} - \frac{1}{32} + \cdots$

A) $\frac{2}{5}$ B) $\frac{5}{8}$ C) $\frac{8}{5}$ D) None

52) Sum of $0.1 + 0.01 + 0.001 + \cdots$

A) $\frac{1}{2}$ B) $\frac{2}{9}$ C) $\frac{1}{9}$ D) None

53) If $\frac{x}{y} = 0.\overline{3}$ then $\frac{x+y}{2}$ is or A.M of x, y

A) 2 B) 3 C) 1 D) None

54) An infinite G.P has 1st term is 7 and Sum = 4 then

A) $x \geq 2$ B) $x < 3$ C) $0 < x < 8$ D) None

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55) $2^{\frac{1}{2}} \cdot 4^{\frac{1}{8}} \cdot 8^{\frac{1}{24}} \cdots \infty$

A) 2 B) 1 C) $\frac{1}{2}$ D) None

56) 2, 4, 8, ... $\frac{n}{2}$ terms, Sum

A) $2^{\frac{n-1}{2}} - 1$ B) $2^{n+1} - 2$ C) 2^{n+1} th D) None

57) $(-1)^n$ is

A) Convergent B) Divergent C) Neither D) None

58) Any series which is Convergent is

A) Convergent B) Divergent C) Neither D) None

59) $2.\overline{23}$ in Common fraction is

A) $\frac{221}{99}$ B) $\frac{2 \cdot 3}{4}$ C) $\frac{225}{92}$ D) None

60) $0.\overline{1234} = \frac{x}{y}$ then $x+y$

A) 4163 B) 4613 C) 2163 D) None

61) If first term of G.P is twice the sum of terms after it then $r =$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) None

62) Product of 50 G.M b/w 4 and $\frac{1}{4}$

A) 1 B) 2 C) 3 D) None

63) Product of 4 G.M b/w 3 and 729

A) 3^{12} B) 3^{14} C) 3^{16} D) None

64) $2+2+2+2 \ldots$ n

A) 2n B) 4n C) 6n D) None

65) $y = 1+2x+4x^2 \ldots$
then $x =$

A) $\frac{y-1}{2y}$ B) $\frac{y+1}{2y}$ C) $\frac{y^2-1}{2}$ D) None

66) $1, \frac{1}{3}, \frac{1}{5}$ —

forms

A) A.P B) G.P C) H.P D) None

67) If $-4, -2, 0, 2$ is A.P then G.P is

A) $\frac{1}{-4}, \frac{-1}{2}$ B) $\frac{1}{3}, \frac{1}{4}$ C) $\frac{1}{4}, \frac{1}{2}$ D) None

68) $1, \frac{1}{3}, \frac{1}{5}$ for H.P then 7th term is

A) $\frac{1}{11}$ B) $\frac{1}{13}$ C) $\frac{1}{12}$ D) None

69) $\frac{1}{An+B} = a_n$ is

A) A.P B) G.P C) H.P D) None

70) If a, b are distinct +ve real #s then

A) $A > G > H$ B) $A < G < H$ C) $A \geq G \leq H$ D) None

71) WOF is true If A, G, H are respective means

A) $G^2 = AH$ B) $H^2 = GA$ C) $H^2 = GH$ D) None

72) If A.M and H.M of two +ve numbers are $\frac{32}{5}$ and 10 respectively then GM

i) 8 B) -8 C) Both D) None

73) $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ is H.M if n =

A) 0 B) -1 C) 1 D) None

74) $\sum_{i=2}^{10} \left(\frac{1}{i}\right) = \sum_{j=1}^{8} \left(\frac{1}{j+2}\right)$

A) 1 B) 0 C) $\frac{1}{2}$ D) None

75) Sum of First 16 term of $1^2 + 2^2 + 3^2 - \cdots$

A) 375 B) 321 C) 14 D) 16

75) Largest interval for which $1+(x-1)+(x-1)^2+\cdots$ may be summed

A) $0<x<1$ B) $0<x<2$ C) $-1<x<1$ D) $-\infty<x<\infty$

76) WOF is convergent

A) 2^n B) $2n$ C) $\frac{1}{2n}$ D) None

77) WOF is divergent

A) $1+\frac{1}{n}$ B) $\frac{(-1)^n}{n^2}$ C) $\frac{(-1)^n}{n!}$ D) $(-1)^n$

78) WOF is n^{th} term of A.P

A) 2×3^n B) $\frac{1}{n+1}$ C) $3n-8$ D) All

79) $a_1=3$, $a_n=a_{n-1}+2$ for all $n>1$ $a_{50}=$

A) 100 B) 101 C) 120 D) None

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80) If Sum of 1st n terms of two A.P are in ration $3n+8 : 7n+15$ then their 7th terms are in the ratio

A) 47:06 B) 47:106 C) 8:15 D) None

81) For a G.P $a_{13-1}, a_{1+8} = \frac{243}{32}$ then r=

A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{3}{2}$ D) None

82) HM b/w $\frac{1}{a}$ and $\frac{1}{y}$ is

A) $\frac{2}{x+y}$ B) $\frac{x+y}{2}$ C) xy D) $\frac{x+y}{2xy}$

83) Exact value of $0.3\overline{18}$ is

A) $\frac{7}{22}$ B) $\frac{22}{8}$ C) $\frac{21}{7}$ D) None

84) If A and G are A.M and G.M respectively then A+G is

A) $a-b$ B) $(\sqrt{a}+\sqrt{b})^2$ C) $\left(\frac{\sqrt{a}+\sqrt{b}}{2}\right)^2$

D) $\left(\frac{\sqrt{a}-\sqrt{b}}{2}\right)^2$

85) WOF is Convergent

A) $1-1+1-1---\infty$ B) $1+2+3---\infty$ C) $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}---\infty$

D) $2+2^2+2^3---\infty$

86) $\sum_{k=1}^{n} k = 36$ then $n=$

A) 8 B) 16 C) 4 D) None

87) If $S(x) = 1+\frac{1}{2^x}+\frac{1}{3^x}---\frac{1}{n^x}$ then $S(-1)$

A) $\frac{n(n+1)(2n+1)}{6}$ B) $\frac{n^2(n+1)^2}{4}$ C) $\frac{n(n+1)(n+4)}{2}$ D) $\frac{n(n+1)}{2}$

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BINOMIAL THEOREM

i) The term without variable x in expansion of $\left(\frac{a}{x} + \frac{x}{a}\right)^{10}$ will be ____ term

A) 5th B) 6th C) 7th D) 10th

2) the r^{th} term of $(a+b)^n$ expansion

A) $\binom{n}{r-1} a^{n-r+1} \left(b\right)^{r-1}$ B) $\binom{n}{r} a^{n-r} \cdot b^{r}$ C) Both

D) None

3) Sum of coefficients in expansion of $(x-y)^n$ where $n=10$

A) 0 B) 1 C) -1 D) None

4) When Sum of Even Binomial Coeffeicents is 512 the binomial expression will be

A) $(1+x)^{10}$ B) $(1+x)^{9}$ C) $(1+x)^{8}$ D) $(1+x)^{11}$

5) If x is such that x^2 and higher powers can be neglected the $\sqrt{\frac{1-3x}{1+4x}}$ =

A) $1-\frac{7x}{2}$ B) $1-\frac{2x}{7}$ C) $1-\frac{2}{7x}$ D) $1-\frac{7}{2x}$

6) Sum of Powers of x and y in $(x-y)^{11}$

Sum upto

A) 10 B) 11 C) 12 D) None

7) Number of term in $(1+x)^{-2}$

A) 2 B) 3 C) 1 D) None

8) Last term in expansion of $(3x+3y)^7$

A) $3y^7$ B) 3^7y^7 C) $y^3.7^3$ D) None

9) The expression $\left(9+\frac{2}{x}\right)^{-3/2}$ is valid if

A) $|x| > \frac{9}{2}$ B) $|x| < \frac{2}{9}$ C) $|x| < \frac{9}{2}$ D) $|x| > \frac{2}{9}$

10) if n is Even then middterm of Expansion of $(a+b)^n$

A) $\left(\frac{n+1}{2}\right)^{th}$ B) $\left(\frac{n+2}{2}\right)^{th}$ C) $\left(\frac{n}{2}+1\right)^{th}$ D) Both B/C

11) $3C_1 + 3C_2 + 4C_3 + 5C_4 + 6C_5$

A) $7C_5$ B) $7C_6$ C) $21C_{15}$ D) None

12) $\binom{4}{4} + \binom{5}{4} + \binom{6}{4} \cdots \binom{n+3}{4}$

A) $\binom{n}{4}$ B) $\binom{n+1}{4}$ C) $\binom{n+4}{5}$ D) $\binom{n+1}{5}$

13) if $n \in N$, then $n! > n^2$ is true for all

A) n B) $n>1$ C) $n>2$ D) $n>3$

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14) for all $n \in N$, n^2th is

A) Even B) odd C) Prime D) irrational

15) Which term of $\left(\frac{x+1}{x^2}\right)^{10}$ is constant

A) 3rd B) 4th C) 5th D) None

16) $n C_r = 0$, if

A) $n-r=0$ B) $n-r>0$ C) $n-r<0$ D) $n-r \neq 0$

17) Value of Numerically greatest term in $(3-2x)^{10}$ when $x=\frac{3}{4}$ is

A) $\frac{3}{8}\,{}^{10}C_4$ B) $\frac{3^{10}}{8}\,{}^{10}C_3$ C) $\frac{2^7}{5^2}\,{}^{10}C_5$ D) None

18) Middle term of expansion $\left(x-\frac{1}{y}\right)^{12}$ is

A) 13th B) 8th C) 7th D) 6th

19) Largest Coeffecient of $(1+x)^{32}$ is

A) $32C_{14}$ B) $32C_{15}$ C) $32C_{16}$ D) $32C_{17}$

20) if $y = \sqrt{1+\sqrt{1+\sqrt{1+\ldots\infty}}}$ $y = 1+\frac{1}{3}+\frac{5}{36}-\infty$

then y^3

A) 4 B) 3 C) 2 D) 5

21) If n is positive integer then the expansion of $(1+x)^n$

A) Terminates after n terms B) terminates after (n+1) terms

C) Terminates after n-1 terms D) Never terminates

22) Sum of coeffecient of $(3x+2y-z)^7$ is

A) 4^7 B) 7^4 C) $7C_4$ D) $7P_4$

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23) if $1+\frac{3}{4}+\frac{3\cdot5}{4\cdot8}$ ... is identical with $1+nx+\frac{n(n-1)}{2!}x^2+\ldots$ then $n=$

A) -2 B) $-\frac{1}{2}$ C) $-\frac{3}{2}$ D) $\frac{1}{3}$

24) Expansion of $(2x-8)^{-3}$ as an infinite series in x is valid if

A) $|x| \leq 2$ B) $|x| < 2$ C) $|x| \geq 2$ D) $|x| > 2$

25) if n is a rational number or a negative integer, then number of terms in $(a+b)^n$

A) $n+1$ B) $n-1$ C) $\frac{n}{2}$ D) ∞

26) Pascal triangle can be used to find ____ in $(a+b)^n$

A) Exponents of a, b B) Number of a, b C) Binomial Coefficients D) Terms

27) $nC_5 = nC_{20}$ ... $nC_5 = nC_{20}$

$n=?$

A) 20 B) 25 C) 10 D) None

28) $nC_r + nC_{r-1}$

A) nC_r B) $n+1C_{r+1}$ C) $n+1C_r$ D) None

29) 3rd term of $(a+b)^n$ has binomial coefficient equal to

A) First B) Last C) 3rd Last D) None

30) Ratio of sum of Binomial Coefficients to sum of coefficients in $(3x+y+z)^{10}$ $(x-y)^{10}$

A) ∞ B) 2^{10} C) $\frac{1}{2^{10}}$ D) None

31) which term of $\left(\frac{1}{x} + x^2\right)^9$ contains no power of x

A) No term B) 4th term C) 5th term D) 6th term

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32) for all $n \in N$ $(n(n+1))^2$ or $n^2(n+1)^2$ is divisible by

A) 6 B) 4 C) 2 D) None

33) 3rd term of $\left(2+\frac{4}{x}\right)^{\frac{1}{2}}$ is

A) $1-x+\frac{x^2}{12}$ B) $\frac{-1}{2x^2}$ C) $\frac{-1}{\sqrt{2}x^2}$ D) $\frac{1}{\sqrt{2}}x^2$

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1) $f(x) = 2$ or all horizontal Lines are

A) Even ftn B) odd ftn C) Both D) None

2) If $f: X \longrightarrow Y$ is a function from $X - Y$ then Range is

A) Set of Y B) Subset of Y C) Codomain D) None

3) In previous Question, Y is

A) Domain B) Co Domain C) Range D) None

4) $y = x^2$ → the dependent variable

A) Y B) x C) Neither D) None

5) Inverse of which function exist

A) into B) onto C) one-one D) Bijective

6) Range of $x^2+5 = f(x)$

A) $[5,\infty)$ B) $(-\infty, 5)$ C) $(5,\infty)$ D) None

7) The identity function bisects Quadrant 1 and

A) 2 B) 3 C) 4 D) None

8) The Slope of Constant functions is

A) $\frac{1}{0}$ B) 0 C) -1 D) None

9) Range of Linear functions is

A) $(-\infty,\infty)$ B) $(0,\infty)$ C) $(\infty,1)$ D) None

10) Domain of inverse of exponential function

A) $(0,\infty)$ B) $(-\infty,0)$ C) $[2,3]$ D) None

11) Range of inverse of $\sqrt{x-1}$

A) $x>1$ B) $x<1$ C) $x\geq 1$ D) None

12) $\sqrt{(-a)^2}$

A) a B) -a C) Both D) None

13) $|x| > a \rightarrow$

A) $-a > x > a$ B) $-a > x > a$ C) $-a < x < a$ D) None

14) If a, b such that $a < b$ then $(x-a)(x-b) < 0$

A) $a < x < b$ B) $-a < x < -b$ C) $-a > x > b$ D) None

15) $\frac{(\sqrt{x})^2}{2x+1}$ is

A) Rational function B) Power function C) Polynomial
D) None

16) Product of two odd fn Gives

A) Even B) odd C) Neither D) None

17) $f(x) = \sin x \cdot \tan x$ is

A) Even B) odd C) Neither D) None

18) Graph of Even fn is symmetric w.r.t

A) x-axis B) y-axis C) y=x D) None

19) A function and its ~~graph~~ inverse are symmetric w.r.t

A) x-axis B) y-axis C) y=x D) None

20) $f(x) = \frac{3x+2}{5x^2-5}$ then $f(f^{-1}(-2))$

A) -2 B) 2 C) 3 D) 1

21) If (1,3) lies on the Graph of an odd function then which point also lies on the Graph

A) (-2, -1) B) (1, 2) C) (3, -1) D) (-1, -3)

22) Product of Even function and odd function gives

A) Even B) odd C) Neither D) None

23) $f^{-1}(x) = \frac{1}{f(x)}$

A) True B) False C) Neither D) None

24) If $f(x) = \sin^2 x \tan x$ then $(f^{-1})^{-1}(x)$

A) $\sin x \tan x$ B) $\sin^2 x \tan x$ C) $(\sin x)^2$ D) None

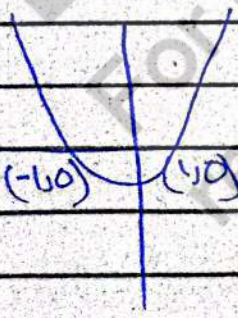
25) Inverse of $\frac{2x^3 - 8}{3} = f(x)$

A) $\sqrt[3]{\frac{3x+8}{2}}$ B) $\sqrt[3]{\frac{2}{3x+8}}$ C) $\sqrt[3]{\frac{3x-8}{2}}$ D) None

26) Range of $ax^2 + bx + c$ if $a < 0$

A) $\left(-\infty, c - \frac{b^2}{4a}\right)$ B) $\left(-\infty, b - \frac{c^2}{4a}\right)$ C) $\left(\frac{c-b^2}{4a}, \infty\right)$ D) None

27)



Equation of Parabola

A) $-1(x-1)(x+1)$ B) $(x-1)(x+1)$

C) $-1(x+1)^2$ D) None

28) WOF is not a function

A) $2x+3y=6$ B) $x^2-y=6x-5$ C) $x^2+y^2=16$

D) $y=4x^3-5x^2+3x-7$

29) Vertex of $-x^2+4x-5=f(x)$

A) $(2,1)$ B) $(2,-1)$ C) $(-2,1)$ D) None

30) $f(x)=\frac{2x}{2x+1}\cdot[f(x)]^{-1}$

A) $\frac{4}{5}$ B) $\frac{5}{4}$ C) $\frac{1}{2}$ D) None

31) If $X=\{a,b,c\}$ and $Y=\{1,2,3\}$ then which of the following relations a function

A) $\{(a,1),(b,2)\}$ B) $\{(a,2),(b,1),(b,3)\}$

C) $\{(a,1),(b,1),(a,3),(c,1)\}$ D) $\{(a,3),(b,1),(c,3)\}$

32) Common points on the Graphs of

$f(x) = x^2 - 3x + 7$ and $g(x) = 2x + 1$

A) (2,5), (3,7) B) (5,2), (7,4) C) (7,3) (-1,7) D) (-1,1) (2,2)

33) $f(x-1) = x^2 + 3x - 5$ then $f(x+1)$

A) $x^2 + 5x - 7$ B) $x^2 + 3x - 5$ C) $x^2 + 7x + 5$ D) None

34) WOF is neither even nor odd

A) $f(x) = \cos^2 x - \sin^2 x$ B) $f(x) = 0$ C) $f(x) = 1 - x$

D) None

35) let a function be such that $f(x) = f^{-1}(x)$

If $f(x) = ax + 1$, then $a =$

A) 2 B) 1 C) -1 D) 2

36) The parabola ax^2+bx+c does not intersect x-axis if

A) $b^2<4ac$ B) $a>0$ C) $a<0$ D) $b^2=ac$

37) $f(5x) = \frac{x}{x^2+1}$, $f(x) =$

A) $\frac{x}{x^2+5}$ B) $\frac{5x}{x^2+25}$ C) $\frac{5x}{2\sqrt{5}x^2+1}$ D) None

38) $f(x) = |x-1|$ is

A) Bijective B) one to one C) Many to one D) None

39) Vertex of the parabola $2x^2-x-1 = f(x)$

A) $(\frac{1}{2}, 2)$ B) $(\frac{1}{4}, -\frac{9}{8})$ C) $(2,1)$ D) $(0,0)$

40) The function $f: R \to R$ defined by $f(x) = 3x-2$ is

A) one-one & onto B) Many one & onto

C) one-one but not onto D) Neither one-one nor onto

41) Range of x^2+2x+5

A) $(-\infty, \infty)$ B) $(-\frac{2}{3}, \infty)$ C) $(-\infty, \frac{5}{4})$ D) None

42) $|x-\frac{3}{2}|$ is Symmetric about

A) $x=\frac{3}{2}$ B) $x>\frac{3}{2}$ C) $x<\frac{3}{2}$ D) None

43) $|3-4x| = 4x-3$ → if x

A) $-\frac{4}{3}$ B) $>\frac{4}{3}$ C) $>\frac{3}{4}$ D) None

44) $|x-1| = x-1$ for x

A) $x=1$ B) $x>1$ C) $x<1$ D) None

45) Graph of $x^2+y^2=4$ is Symetric about

A) x-axis B) y-axis C) origin D) All

46) $f(3)=f(4)=0$ and $f(x)=x^2+bx+c$ then b, c are

A) $b=-3, c=4$ B) $b=3, c=4$ C) $b=-7, c=12$ D) $b=-1, c=-7$

47) Range of $f(x)$ =
$$\begin{cases} 1 & \text{if } x>0 \\ 0 & \text{if } x=0 \\ -1 & \text{if } x<0 \end{cases}$$

A) R B) $R-\{-1,0,1\}$ C) $\{-1,0,1\}$ D) None

48) Domain of $\sqrt{9-x^2} = f(x)$

A) R B) $\{x \in R \mid -3 < x \leq 3\}$ C) $R-\{x \in R \mid -3 < x \leq 3\}$

D) $\{x \in R \mid x < -3 \text{ & } x > 3\}$

49) $2x^4 + 7x^6(x^{-1}+x^{-3}) - 3x^2 - x + 1$ is polynomial with degree

A) 1 B) 6 B) 5 D) None

50) Wof is Even ftn

A) $-\sin x$ B) x^3 C) $|x+1|$ D) $\frac{e^{x+1}}{e^{x-1}}$

D) The ftn $f: N \to N$, $f(x) = 2x \ \forall x \in N$, is

A) one-one & onto B) one-one but not onto C) Onto but not one-one
D) Neither one-one nor onto

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Miscellaneous Topics → Logs, roots, Complex roots

1) $\log_b^a = c$
iff

A) $a>0$ B) $b>0, b\neq 1$ C) Both D) None

2) If $\log_b^a$ such that $0<a<1$ then $\log_b^a$ is

A) $=0$ B) >0 C) <0 D) None

3) $\log_2 \frac{1}{8}$

A) 2 B) -3 C) -2 D) None

4) $\log_{10}^{100}$

A) 2 B) -2 C) 3 D) None

5) $\log_5 1$

A) 1 B) 0 C) 2 D) None

6) $\log_1 0$

A) 1 B) 0 C) Not defined D) None

7) $\log_{x-1}^{(x-1)}$

A) 1 B) 0 C) Not defined D) None

8) $\log_x 256 = 4$

A) 4 B) -4 C) Both D) None

9) $\log_4 28 = m$ then $\log_4 \frac{64}{28} =$

A) $m-3$ B) $-m$ C) $3-m$ D) None

10) $4^{\log_{16} 2}$

A) 10 B) 0 C) 1 D) None

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11) $\log \frac{4}{7} + \log \frac{33}{18} - \log \frac{22}{21}$

A) 1 B) 0 C) 2 D) None

12) $\log_3 (\log_5 125)$

A) 3 B) 1 C) 2 D) None

13) $2 + \log_3 27 = \log_3 4x+7$

A) $x = 54$ B) $x = 59$ C) $x = 50$ D) None

14) $\log_3 x+1 = -\log_3 x+3 + 1$

A) 0 B) -4 C) Both D) None

15) $\log_2 (\log_3 x) = 3$

A) 3^8 B) 3^6 C) 3^9 D) None

16) $\log_2 1$

A) $\frac{\log_3 1}{\log_3 2}$ B) $\frac{\ln 1}{\ln 2}$ C) Both D) None

17) $\log_{3^5} \frac{1}{5} =$

A) $\frac{1}{\log_{\frac{1}{2}}^3}$ B) $\log_2^{-3}$ C) $\frac{1}{\log_3^{\frac{1}{2}}}$ D) None

18) $\log_a^b =$

A) $\frac{1}{\log_b^a}$ B) $\frac{1}{\log_a^b}$ C) 1 D) None

19) $\log_3^4 \times \log_4^5 \times \log_5^6 \times \log_6^7 \times \log_7^8 \times \log_8^9$

A) 1 B) 0 C) 2 D) None

20) $\log_b^a \times \log_a^c \times \log_c^d$

A) $\log_b^d$ B) $\log_d^b$ C) $\log_b^b$ D) None

20) ~~$\log_b^a$~~ ✗

21) $\log_b n^a$ =

A) $\frac{1}{n}\log_b^a$ B) $n\log_b^a$ C) $-n\log_b^a$ D) None

22) $\log_2^{10}$
$>$

A) 10 B) 2 C) $\frac{1}{\log_2^{10}}$ D) None

23) $e^{\ln f(x)}$

A) $f(x)$ B) $(f(x))^2$ C) $f(2x)$ D) None

24) $\log\frac{30}{3} - \log_3^{10}$

A) 2 B) 1 C) 0 D) None

25) If roots of $3x^2+(m-1)x+5=0$ has equal roots then $m=$

A) 1 B) $\frac{2}{3}$ C) $\frac{1}{4}$ D) None

26) roots of $x^2-2x+1=0$

A) $-1,-1$ B) -1 C) 1 D) None

27) Sum of roots of $3x^2+4x+5$

A) $\frac{-4}{3}$ B) $\frac{5}{3}$ C) $\frac{3}{4}$ D) None

28) If $\alpha+\beta=10$ and $3x^2+Kx+5=0$ find K

A) 30 B) -30 C) 20 D) None

29) Find K if roots are additive inverses of one another.

A) ±1 B) ±2 C) ±3 D) None

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30) If roots of ax^2+bx+c are α, β find equation whose roots are $\frac{1}{\alpha}, \frac{1}{\beta}$

A) $a^2x^2-(ab^2-2ac)x+c^2$ B) $a^2x^2-(b^2a^2-2ac)x+c$

C) $ax^2-(ab^2-2ac)x+c$ D) None

31) If roots of ax^2+bx+c are α, β, find equation whose roots are $\frac{1}{\alpha}, \frac{1}{\beta}$

A) cx^2+bx+a B) cx^2-bx+a C) ax^2-bx-c D) None

32) $(2\omega)^2+(2\omega)^4$ if ω is Cube root of unity

A) 132 B) 124 C) 64 D) None

33) Product of 5th roots of unity are

A) 1 B) -1 C) 0 D) None

34) If $x = 2+\sqrt{3}i$ is root of $x^2+2x+20$ then the other root is

A) $\sqrt{3}+2i$ B) $2-\sqrt{3}i$ C) $12+\sqrt{3}i$ D) None

35) If x^2-3x+1 is divided by $x+1$, find remainder

A) 5 B) 4 C) 3 D) None

36) x^3-2x+k is perfectly divided by $x+2$ find k

A) $k=3$ B) $k=4$ C) $k=5$ D) None

37) $w^{-28}+w^{-29}=$

A) 1 B) 0 C) -1 D) None

38) $\frac{1}{x^2-1} = \frac{A}{x+1} + \frac{B}{x-1}$, Find A, B

A) $\frac{1}{2}, \frac{-1}{2}$ B) $\frac{-1}{3}, \frac{1}{3}$ C) 1, -1 D) None

39) $\frac{3x+2}{(x-2)(x-3)} = \frac{A}{x-2} + \frac{B}{x-3}$

Find A, B

A) 5, 6 B) 2, 3 C) 1, 4 D) None

40) Sum of 8^{th} roots of unity

A) -1 B) 0 C) 1 D) None

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TRIGONOMETRY

(i) $90^\circ = ?$

A) $100G$ B) 100^g C) 100^g D) None

(ii) An angle measures 20^g in Centasimal how many degrees will it measures in Sexagesimal system.

A) 20° B) 30° C) 18° D) None

(iii) Formular of length of arc

A) $S = \theta x$ B) $l = r\theta$ C) $l = r\theta$ (θ in radian)
D) None

(iv) length y are when θ is 30° and $x = 2$

A) 60° B) 60 C) $\frac{\pi}{3}$ D) None

v) $\frac{\pi}{12} = ?$

A) 15° B) 30° C) 45° D) None

vi) $30^\circ = ?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{6}$ D) None

vii) $10^\circ 30'$

A) $10.5' \frac{\pi}{180}$ B) $\frac{7\pi}{120}$ C) Both A and B

D) None

viii) $\frac{2\pi}{15'} = ?$

A) 12° B) 24° C) 36° D) None

ix) $\sin(x+y)$

A) $\sin x \cos y + \cos x \sin y$ B) $\sin x \cos x - \cos y \sin x$

C) $\sin x \cos y - \cos x \sin y$ D) None

x) 1 radian = ?

A) 57° 16' 22' B) 57° 20'
C) 58° D) None

11) Find angle b/w hr band and min band at 4:30 pm

A) 30° B) 20°
C) 45° D) None

12) Sum of Interal angle of hexagon

A) 180° B) 360° C) 720° D) None

13) Each internal angle of heptagon is

A) 130° B) 150° C) 128.5° D) None

14) Cos (2nπ)

A) 1 B) 0 C) 2 D) None

15) $\cos((2n+1)\pi)$

A) 1 B) -1 C) 0 D) None

16) $\sin(2n\pi)$

A) 0 B) 1 C) -1 D) None

17) $\sin((2n+1)\pi)$

A) 1 B) 0 C) -1 D) None

18) $\frac{\sin(-\theta)}{\cos(-\theta)}$

A) $-\tan\theta$ B) $\tan\theta$ C) $\cot\theta$ D) None

19) $\sin 270 + 5\cos 180 - 3\cos 270$

A) -5 B) 5 C) -6 D) None

(20) If $\cos\theta = \frac{5}{13}$, θ lies in 4th Quadrant
Find $\tan\theta$

A) $\frac{-5}{12}$ (B) $\frac{-12}{5}$ C) $\frac{-5}{12}$ D) None

21) If $\cos\theta = \frac{-5}{13}$, $\theta \in (\pi, \frac{3\pi}{2})$

Find

$$\frac{5\tan\theta + 12\sin\theta}{12\cot\theta + 5\csc\theta}$$

A) 1 B) 0 C) -1 D) None

22) If $\sec\theta + \tan\theta = x$
then $\sec\theta - \tan\theta =$

A) x^2 B) $\frac{1}{x}$ C) x^3 D) None

23) $\cos(180 - b\theta) =$

A) $\sin b\theta$ B) $\cos b\theta$ C) $-\cos b\theta$ D None

24) $\frac{\sin(180-\theta)}{\cos(180-\theta)}$

A) $\sin\theta$ B) $\cos\theta$ C) $-\tan\theta$
D) None

25) θ and $n\pi+\theta$ are allied angles

A) True B) False C) Depend on Quadrant
D) None.

26) $\theta, 180-\theta$ are

A) Allied angles B) complementary
C) Supplementary D) None

27) θ and $(2n+1)\frac{\pi}{2}+\theta$ are

A) complementary B) supplementary
C) Allied D) None

28) $\cos(x+y)$

A) $\cos x \sin y - \sin x \sin y$ B) $\cos x \cos y - \sin x \sin y$
C) $\cos x \cos y + \sin x \sin y$ D) None

29) $\frac{\sin 13 \cos 77 + \cos 77 \sin 13}{\cos 13 \cos 77 - \sin 13 \sin 77}$

A) 0 B) ∞ C) 1 D) None

30) $\tan(2\pi - \theta)$

A) $\tan\theta$ B) $-\tan\theta$ C) $\sin\theta$ D) None

31) $\cos(5\pi - \theta) =$

A) $\sin\theta$ B) $\cos\theta$ C) $-\cos\theta$ D) None

32) $\sin 135 =$

A) $\sin 45$ B) $-\cos 45$ C) $\tan 45$ D) None

33) $\sin(300^\circ)$

A) $\frac{-\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) None

34) $\cos(480^\circ)$

A) $\frac{1}{12}$ B) $+\frac{1}{2}$ C) $\frac{-1}{2}$ D) None

35) $\frac{3\pi}{8}$, $\frac{\pi}{8}$ are

A) complementary B) supplementary C) Allied D) None

36) $\sin\left(\frac{\pi}{8}\right) =$

A) $\cos\left(\frac{\pi}{6}\right)$ B) $\cos\left(\frac{3\pi}{8}\right)$ C) $\sin\left(\frac{\pi}{7}\right)$

D) None

37) $\sin(105^\circ)$

A) $\frac{1}{2}$ B) 1 C) $\frac{-1}{2}$ D) None

38) $\sin\left(\frac{9\pi}{4}\right)$

A) $\frac{1}{\sqrt{2}}$ B) $\frac{-1}{\sqrt{2}}$ C) 1 D) None

39) $\cos 24 + \cos 55 + \cos 125 + \cos 204 + \cos 300 =$

A) 1 B) -1 C) $\frac{1}{2}$ D) None

40) $\sin x =$

A) $2\sin x \cos x$ B) $2\sin\frac{x}{2}\cos\frac{x}{2}$

C) $\cos^2 x$ D) None

41) $\frac{1-\cos 2x}{\sin 2x}$

A) $\tan x$ B) $2\sin^2(2x)$ C) $-\tan x$ D) None

42) $1-\cos 4x$

A) $2\sin^2 x$ B) $2\sin^2(2x)$ C) $\sin^2(x)$ D) None

43) $1+\cos 2x$

A) $2\sin^2 x$ B) $2\cos^2 x$ C) $\frac{\cos^2 x}{3}$ D) None

44) $\left|\frac{1-\cos 2x}{1+\cos 2x}\right|$

A) $\cot x$ B) $\frac{1}{\cot x}$ C) $\sin x$ D) None

45) $\sin x - \sin y$

A) $2\sin\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$ B) $\sin\left(\frac{x+x}{2}\right)\sin\left(\frac{x-y}{2}\right)$

C) $-2\cos\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$ D) None

46) $\cos 4x$

A) $\cos^2 x - \sin^2 x$ B) $\cos^2(2x) - \sin^2(2x)$

C) $\cos^2 4x - \sin^2(4x)$ D) None

47) $\sin 80^\circ + \sin 20^\circ$

A) $2 \sin 50 \cos 30$ B) $2 \cos 50 \sin 30$

C) $-2 \sin 30 \cos 50$ D) None

48) $\cos^4 x - \sin^4 x$

A) $\tan 2x$ B) $\cos 2x$ C) $\sin 2x$ D) None

49) $\tan 2x$

A) $\frac{2 \tan x}{1 + \tan^2 x}$ B) $\frac{2 \tan x}{1 - \tan^2 x}$ C) $\frac{2 \tan x}{1 + \tan x}$ D) None

50) $\sqrt{1 + \sin x}$

A) $\sin x + \cos x$ B) $\sin \frac{x}{2} + \cos \frac{x}{2}$

C) $\sin x - \cos x$ D) None

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S1) $\sin 3x$

A) $3\sin x - 4\cos^3 x$ B) $3\sin x + 4\cos^3 x$ C) $3\sin x - 4\sin^3 x$
D) None

S2) $\cos 3x$

A) $4\cos^3 x - 3\cos x$ B) $3\cos x - 4\sin^3 x$ C) $3\cos x + 4\cos^3 x$
D) None

S3) $(\sin\theta + \cos\theta)^2$

A) $1 - \cos 2\theta$ B) $1 + \sin 2x$ C) $1 + \sin x$ D) $1 + \sin 2\theta$

S4) $\tan(270 + \theta)$

A) $\sin\theta$ B) $\cos\theta$ C) $-\cot\theta$ D) None

S5) $\dfrac{\cos\beta + \cos 3\beta + \cos 5\beta}{\sin\beta + \sin 3\beta + \sin 5\beta}$

A) $\sin 3\beta$ B) $\cos 3\beta$ C) $\cot 3\beta$ D) None

S6) $\dfrac{\cos 10 + \cos 30 + \cos 50}{\sin 10 + \sin 30 + \sin 50}$

A) $\frac{1}{2}$ B) $\frac{-1}{2}$ C) $\sqrt{3}$ D) None

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57) $\cos 90 - \cos 30$

A) $-2\sin 60 \sin 30$ B) $-2\cos 60 \sin 30$ C) $-2\cos 90$

D) None

58) $\cos 120 - \cos 70$

A) $-2\sin 95 \sin 25$ B) $2\cos 95 \sin 25$

C) $-2\tan 120$ D) None

59) $-2\sin 120 \sin 70$

A) $\cos 190 - \cos 30$ B) $\cos 190 - \cos 50$ C) $\sin 190 - \sin 50$

D) None

60) $\tan 3x$

A) $\frac{3\tan x - \tan^3 x}{1+3\tan^2 x}$ B) $\frac{3\tan x \cdot \tan^3 x}{1-3\tan^2 x}$ C) $\frac{3\tan x \cdot \tan^3 x}{1-3\tan x}$

D) None

61) $\sin 13 \cos 87 + \cos 13 \sin 87$

A) $-\cos 10$ B) $-\sin 10$ C) $\cos 90$ D) None

62) $\cos 30 \cos 20 - \sin 30 \sin 20$

A) $\sin 40$ B) $\cos 40$ C) $\frac{\cos 50}{\cos}$ D) None

63) $\sin(180 - \theta)$

A) $-\sin\theta$ B) $\cos\theta$ C) $\sin\theta$ D) None

64) $\cos(180 - \theta)$

A) $\cos\theta$ B) $-\cos\theta$ C) $\sin\theta$ D) None

65) $\cos 120$

A) $\frac{1}{2}$ B) $\frac{-1}{2}$ C) 1 D) None

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66) $\frac{\cos 75 + \cos 15}{\sin 75 - \sin 15}$

A) $\frac{1}{\sqrt{3}}$ B) $\sqrt{3}$ C) $-\sqrt{3}$ D) None

67) $\cot(\alpha - \beta)$

A) $\frac{\cot\alpha\cot\beta + 1}{\cot\beta - \cot\alpha}$ B) $\frac{\cot\beta - \cot\alpha}{\cot\alpha\cot\beta + 1}$ C) $\frac{1}{\cot 2\beta}$ D) None

68) $\cos 36°$

A) $\frac{\sqrt{5}-1}{2}$ B) $\frac{\sqrt{5}+1}{2}$ C) $\frac{\sqrt{5}+1}{4}$ D) None

69) $2\cos^2 15 - 1$

A) $\frac{1}{\sqrt{3}}$ B) $\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) None

70) $\frac{\sin 36 + \sin 54}{\cos 36 + \cos 54}$

A) 1 B) 0 C) 2 D) None

71) $\frac{\cos^3\alpha - \sin^3\alpha}{\cos\alpha - \sin\alpha}$

A) $1 + \frac{1}{2\csc 2\alpha}$ B) $1 - \frac{1}{2\csc 2\alpha}$ C) $1 - \sin\alpha\cos\alpha$ D) None

72) $\sin 20\cos 70 + \cos 20 \sin 70$

A) 0 B) 1 C) $\frac{1}{2}$ D) None

73) $\sin\left(\frac{4\pi}{2} + \theta\right)$

A) $\cos\theta$ B) $\sin\theta$ C) $\tan\theta$ D) None

74) $\sin(45 + 30)$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) 1 D) None

75) $\sin^2(3x) + \cos^2(3x) =$

A) 3 B) $\frac{1}{3}$ C) 3^2 D) None

76) $\frac{\tan^2 35}{\cot^2 55} - \frac{\sin^2 17}{\cos^2 77}$

A) 1 B) 0 C) 2 D) None

77) $\sqrt{1-\sin x}$

A) $\sin\frac{x}{2} + \cos\frac{x}{2}$ B) $\sin\frac{x}{2} - \cos\frac{x}{2}$ C) $\sin 2x$ D) None

78) $\sin^2 x + \cos^2 x = 1$ for value of $x =$

A) Infinite B) Two C) Two conditionally D) None

79) $\sin\frac{x}{2} =$ for $180 < x < 360$

A) $\pm\sqrt{\frac{1-\cos x}{2}}$ B) $-\sqrt{\frac{1-\cos x}{2}}$ C) $\sqrt{\frac{1+\cos x}{2}}$ D) None

80) $\sin\theta = \frac{1}{2}$, $\tan\theta = \frac{-1}{\sqrt{3}}$ then θ

A) $\frac{-\pi}{6}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) $\frac{5\pi}{6}$

81) $\frac{\cos x}{1-\sin x} - \frac{\cos x}{1+\sin x}$

A) $2\tan x$ B) $2\cos x$ C) $2\sec x$ D) $2\cot x$

82) $\frac{\sin(90-x)}{\cos(90+x)} - \frac{\operatorname{cosec}(90-x)}{\sec(90+x)}$

A) $-\cot x - \sin x$ B) $-\sin x + \cos x$ C) $\sin x$ D) None

83) How many degree are there in one radian

A) $57^\circ 17' 45''$ B) $\left(\frac{180}{\pi}\right)^\circ$ C) $45^\circ 57' 45''$ D) A/C Both

84) 35.39°

A) $35^\circ 24' 23''$ B) $35^\circ 23' 24''$ C) $35^\circ 35' 35''$
D) $39^\circ 33' 19''$

85) Through how many radians does the minute hand of a clock turn in 35 min

A) $\frac{7\pi}{6}$ B) $\frac{5\pi}{4}$ C) $\frac{4\pi}{3}$ D) $\frac{3\pi}{2}$

86) How many hours are there in 135° rotation of hour hand

A) $3\frac{1}{12}$ hr B) $4\frac{1}{2}$ hr C) 5hr D) $7\frac{2}{3}$ hr

87) The terminal side of $\theta = 8.329$ lies in

A) 1st Q B) 2nd Q C) 3rd Q D) 4th Q

88) Trigonometric ratios of $123\frac{\pi}{2}$ is same as

A) $\frac{2\pi}{2}$ B) $\frac{3\pi}{2}$ C) $\frac{15\pi}{5}$ D) None

89) If terminal side of θ lies in 4th Quadrant then terminal side of $\frac{\theta}{3}$ lies in

A) 1st Q B) 2nd Q C) 3rd Q D) 4th Q

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90) If θ lies in 3rd Q, then $\frac{2\theta}{3}$ lies in

A) First Q B) Second Q C) third Q D) None

91) If $0 < \theta < \frac{\pi}{2}$ then which of the following angle lies in 3rd Q

A) $\frac{3\pi}{2} - \theta$ B) $\pi + \theta$ C) $\theta - \pi$ D) All

92) If θ is in 4th Q, then reference angle of θ is

A) $2\pi + \theta$ B) $2\pi - \theta$ C) $\frac{3\pi}{2} + \theta$ D) $\frac{\pi}{2} - \theta$

93) If $\cos\theta < 0$ and $\operatorname{cosec}\theta > 0$ then terminal side of θ lies in

A) 1st Q B) 2nd Q C) 3rd Q D) None

94) $\sin 75^\circ$

A) $\frac{\sqrt{3}+1}{\sqrt{4}}$ B) $\frac{\sqrt{3}+1}{2\sqrt{2}}$ C) $\frac{\sqrt{2}}{\sqrt{3}+1}$ D) None

95) $\tan 15^\circ$

A) $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ B) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ C) $\frac{2}{\sqrt{3}-\sqrt{2}}$ D) $\frac{1}{\sqrt{3}}$

96) $\frac{\tan 13+\tan 32}{1-\tan 13\tan 32}$

A) 0 B) ∞ C) 1 D) -1

97) which of the following is same as $\tan\theta$

A) $\frac{\sin(90-\theta)}{\cos(90-\theta)}$ B) $\frac{1}{\cot\theta}$ C) $\tan(180+\theta)$

D) Both B/C

98) $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$

A) $\sec\theta-\tan\theta$ B) $\sec\theta+\tan\theta$ C) $\operatorname{cosec}\theta-\cot\theta$

D) $\operatorname{cosec}\theta+\cot\theta$

99) $\tan(\pi-\theta)\cdot\cos\left(\frac{\pi}{2}-\theta\right)+\cos(\pi-\theta)$

A) $\cos\theta$ B) $-\sec\theta$ C) $\tan\theta$ D) $\sin\theta-\cos\theta$

100) WOF is same as $\frac{1}{2}(1-\cos 4x)$

A) $\sin^2(2x)$ B) $\cos^2(2x)\cdot\tan^2(2x)$ C) $4\sin^2 x\cos^2 x$

D) All

101) $\sin\alpha=\frac{1}{\sqrt{5}}$ and $\sin\beta=\frac{1}{\sqrt{10}}$ where α,β are in first Q, $\alpha+\beta=$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$

102) $\sin x=\frac{1}{2}$ where x is in first Q then $\tan 2x$

A) $\frac{1}{\sqrt{3}}$ B) $\frac{\sqrt{3}}{2}$ C) $\sqrt{3}$ D) $\frac{2}{\sqrt{3}}$

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103) If θ is not in first Q, $\cos\theta = \frac{4}{5}$ then $\cos\frac{\theta}{2}$

A) $\frac{-1}{\sqrt{10}}$ B) $\frac{}{\sqrt{10}}$ C) $\frac{-3}{\sqrt{10}}$ D) $\frac{4}{\sqrt{10}}$

104) If $\sin\theta = \frac{4}{5}$, $\sin 3\theta =$

A) $\frac{11}{25}$ B) $\frac{22}{125}$ C) $\frac{33}{125}$ D) $\frac{44}{125}$

105) $\cos\theta = \frac{4}{5}$ and terminal ray of θ is not in first Q, then $\tan\frac{\theta}{2}$

A) $\frac{-1}{3}$ B) -1 C) $\frac{2}{3}$ D) None

106) Express $\sqrt{3}\sin\theta + \cos\theta$ in form $(r\sin(\theta+\phi))$ this

A) $2\sin(\theta+30)$ B) $2\sin(\theta+60)$ C) $2\sin(\theta-30)$

D) $2\sin(\theta-45)$

107) in the form of $r\sin(\theta+\phi)$, expression $\sin\theta - \cos\theta$ is

A) $\sqrt{2}\sin(\theta+30)$ B) $2\sin(\theta+45)$

C) $\frac{1}{\sqrt{2}}\sin(\theta-90)$ D) $\sqrt{2}\sin(\theta-45)$

108) $\alpha+\beta=\gamma$ then $\tan\alpha\tan\beta\tan\gamma =$

A) $\tan\alpha+\tan\beta+\tan\gamma$ B) $\tan\alpha-\tan\beta+\tan\gamma$

C) $\tan\beta+\tan\gamma-\tan\alpha$ D) $\tan\gamma-\tan\beta-\tan\alpha$

109) $\tan\alpha=\frac{m}{m+1}$, $\tan\beta=\frac{1}{2m+1}$, $\alpha+\beta=?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) None

110) $\frac{\sin 75+\sin 15}{\cos 75+\cos 15}$

A) 1 B) $\frac{1}{2}$ C) $\frac{1+\sqrt{3}}{2}$ D) $\frac{1}{\sqrt{3}}$

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111) $\left(\sin\frac{\alpha}{2} - \cos\frac{\alpha}{2}\right)^2$

A) $1-\cos\alpha$ B) $1-\sin\alpha$ C) $1+\sin\alpha$ D) None

112) $\frac{1+\cos x+\cos 2x}{\sin x+\sin 2x}$

A) $\tan x$ B) $\cot x$ C) $\tan x-\cot x$ D) $\sec^2 x$

113) If $r=2$ and $\theta = 43^\circ 42'$ then length of arc is

A) $\frac{\pi}{2}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) None

114) Express $\sin 44^\circ \cos 25^\circ$ as sum or difference

A) $\frac{1}{2}(\sin 69+\sin 19)$ B) $\frac{-1}{2}(\cos 69+\cos 19)$ C) $\frac{1}{2}(\cos 69-\cos 19)$ D) None

115) $\sin x + 2\sin 3x + \sin 5x$

A) $2\sin x(\cos 3x)$ B) $\sin 3x - \cos^2 x$ C) $4\sin 3x \cos^2 x$

D) $\sin^2 3x \cos x$

116) $\frac{\cos\theta - \cos 3\theta}{\sin\theta + \sin 3\theta}$

A) $\tan 2\theta$ B) $\sec\theta$ C) $\cot\theta$ D) $\tan\theta$

117) $\frac{\cos(\alpha+\beta) + \cos(\alpha-\beta)}{\sin(\alpha+\beta) + \sin(\alpha-\beta)}$

A) $\sin^2\alpha - \cos^2\beta$ B) $\cot\beta$ C) $\cot\alpha$ D) $\tan(\alpha+\beta)$

118) A Pole of 10m high casts a shadow of $10\sqrt{3}$ m

Find angle of inclination

A) $\frac{\pi}{3}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{4}$ D) None

119) Angle of depression is 30°, height of Perpendicular is $10\sqrt{3}$, find base

A) 2m B) 3m C) 4m D) None

120) $\frac{1-\cos 8\theta}{2\sin^2 4\theta}$

A) $\frac{1}{\cos 2\theta}$ B) 1 C) $\sin 2\theta$ D) None

121) $\frac{(1+\cos 2x)}{\sin 2x}$

A) $\tan x$ B) $\cos x$ C) $\cot x$ D) None

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1) A triangle with no right Angle is called

A) Scalene B) Right C) Oblique D) None

2) $\frac{a+b+c}{2}$ is

A) Semi perimeter B) half Perimeter C) Both D) None

3) Angle of elevation are always

A) Accute B) Obtuse C) Reflexive D) None

4) A triangle with all sides of Different lengths is called

A) Right B) Equilateral C) Scalene D) None

5) (0,0), (3,0) and (3,4) Forms

A) Equilateral B) Equilateral C) Scalene

D) None

6) Projection Laws are

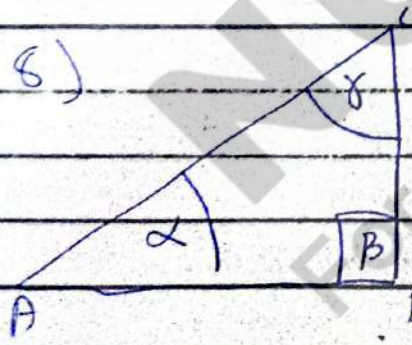
A) $a = b\cos\gamma + c\cos\beta$ B) $b = c\cos\alpha + a\cos\gamma$

C) $c = a\cos\beta + b\cos\alpha$ D) All

7) A triangle has ____ parameters

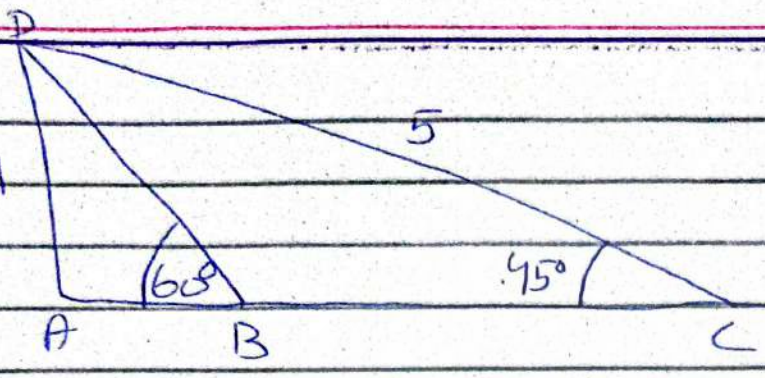
A) 3 B) 6 C) 9 D) None

8)



A) $\frac{AB}{AC}$ B) $\frac{BC}{AC}$ C) $\frac{AC}{BC}$ D) None

9)



Find BC

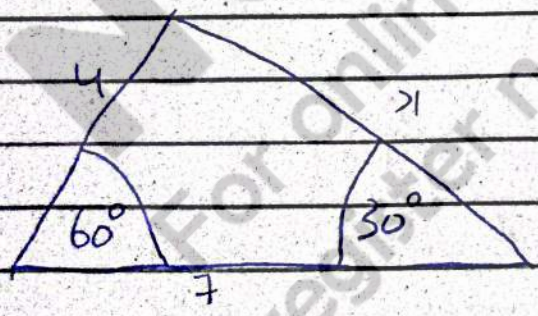
A) $3+4\sqrt{2}$ B) $4-\frac{2}{\sqrt{8}}$ C) 2 D) $3-\frac{4}{\sqrt{3}}$

10) $c^2=$

A) $b^2+a^2+2ba\cos r$ B) $b^2+a^2-2ba\cos r$

C) $b^2+a^2-ba\cos r$ D) None

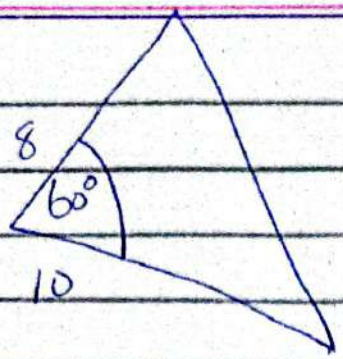
11)



find x

A) 3 B) 4 C) 6 D) None

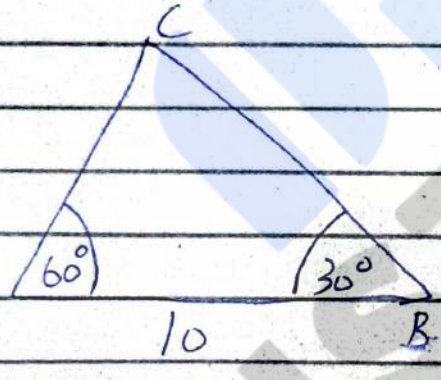
12)



Area of triangle

A) $20\sqrt{2}$ B) 40 C) $20\sqrt{3}$ D) None

13)



Area of triangle

A) $\frac{25\sqrt{3}}{2}$ B) $\frac{25\sqrt{2}}{3}$ C) $\frac{25\sqrt{5}}{3}$ D) None

14) Area of equilateral triangle with one side = 4

A) $\sqrt{3}/2$ B) $2\sqrt{3}$ C) 16 D) $4\sqrt{3}$

15) Area of an equilateral triangle with height 6

A) $12\sqrt{3}$ B) $14\sqrt{5}$ C) 20 D) None

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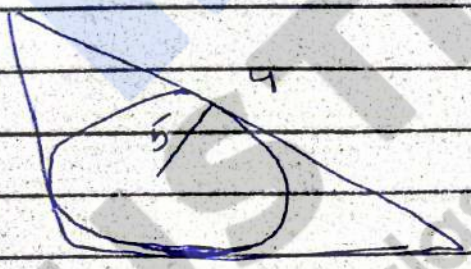
16) $\sqrt{r_1 \cdot r_2 \cdot r_3 \cdot r}$

A) $r^2 s$ B) $r s^2$ C) $r^2 s^2$ D) rs

17)



Perimeter of triangle
Area is 20

A) 1 B) 10 C) 19 D) None

18) $s(s-a)(s-b)(s-c)$

A) Δ B) Δ^2 C) Δ^3 D) None

19) In equilatriangle, r : R : r_1

A) 1 : 3 : 1 B) 1 : 2 : 1 C) 1 : 3 : 2 D) 1 : 2 : 3

20) In a triangle, if $b=2, \beta=30$ area of circumcircle of triangle is

A) 2π B) π C) 3π D) 4π

21) If $2s = a+b+c$ then $\cos\frac{\gamma}{2}$

A) $\sqrt{\frac{s(s-c)}{ab}}$ B) $\sqrt{\frac{s(s-b)}{ab}}$ C) $\sqrt{\frac{s(s-c)}{bc}}$

D) None

22) $\tan\frac{\alpha}{2}$

A) $\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ B) $\sqrt{\frac{(s-a)(s-b)}{(s-c)}}$ C) $\sqrt{\frac{s(s-b)}{s^2}}$

D) None

23) Area of triangle formed by 3, 4, 5

A) $\frac{1}{2}$ B) 6 C) 30 D) None

24) If a right triangle with Radius of 20m circle circumcircling it then hypotenus =

A) 20m B) 10m C) 15 D) None

25) R =

A) $\frac{a}{2\sin\alpha}$ B) $\frac{b}{2\sin\beta}$ C) $\frac{c}{2\sin\gamma}$ D) All

26) An incircle is present in a triangle whoose sids are 3, 4, 5 then inradius is

A) $r = \frac{a+b+c}{2}$ B) $r = \frac{a+b-c}{2}$

C) $r = s-c$ D) Both B/C

27) $a-b+c$ =

A) $s+b$ B) $2(s-b)$ C) $)s-b$ D) $s-b$

28) WOF Cant be measures of sides of a triangle

A) 7,9,13 B) 6,8,15 C) 5,6,9 D) None

29) If two side of a triangle are $2x+1$ and $3x+4$ where $x>0$, which of the following could be its third side

A) $x+2$ B) $5x+6$ C) $4x+5$ D) None

30) If 10, 12 and x are sides of a triangle then how many integer values of x are ther

A) 7 B) 9 C) 11 D) 19

31) Angles of a triangle are in ratio 1:3:5

Actual angles of triangle

A) 30,60,90 B) 20,60,100 C) 10,30,140 D) 10,80,70

32) Angle in equilateral triangle are in ratio

A) 1:1:1 B) 2:6:9 C) 1:2:3 D) 1:8:9

33) In a triangle with usual labelling $a^2 = b^2 + c^2$ then

A) $m\angle\alpha < 90$ B) $m\angle\alpha < 90^\circ$

C) $m\angle\alpha = 90^\circ$ D) None

34) In a triangle with usual labelling if $m\angle\alpha = 35^\circ$ and $m\angle\beta = 61^\circ$ then ABC is

A) Scalene B) Right C) Isosceles D) None

35) If side length of a square is a and that of Equilateral triangle is also a then ratio of their areas is

A) 1:1 B) 4:$\sqrt{3}$ C) $\sqrt{3}$:4 D) 2:3

36) Angle of triangle are in A.P, if largest angle is twice that of smallest then the angles are

A) 40, 60, 80 B) 30, 60, 90 C) 45, 60, 75 D) All

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46) Formulas for Area of triangle

A) $\frac{1}{2}ab\sin\gamma$ B) $\frac{a^2\sin\beta\sin\gamma}{2\sin\alpha}$ C) $\sqrt{s(s-a)(s-b)(s-c)}$

D) All

47) In a triangle with usual labelling, $\gamma =$

A) $\frac{\Delta}{s}$ B) $\frac{s}{\Delta}$ C) sR D) $\frac{abc}{4\Delta}$

48) Let ABC be a triangle, $\sin\alpha =$

A) $\frac{2\Delta}{bc}$ B) $\frac{a}{2R}$ C) $\frac{a}{b}\sin\beta$ D) All

49) In a triangle $\cot\frac{\alpha}{2} + \cot\frac{\beta}{2} + \cot\frac{\gamma}{2}$

A) $\frac{s}{r}$ B) $\frac{\Delta}{s^2}$ C) rs D) rR

50) A Circle is inscribed in an equilateral triangle then another circle is circumscribed around the triangle, the ratio of radii of the inscribed and circumsribed circles is

A) 1:3 B) 2:1 C) 1:2 D) 2:3

51) Radius of Circle inscribed a right angled triangle whoose sides are 3, 4, 5

A) 1m B) 0.5m C) 2m D) 2.5m

52) If the ex radii, r_1, r_2, r_3 of triangle form H.P then sides a, b, c form

A) A.P B) G.P C) H.P D) None

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INVERSE TRIGONOMETRY

1) Period of $f(|x|)$ =

A) $\frac{\text{Period of } f(x)}{k}$ B) $\frac{k}{\text{Period of } f(x)}$ C) Period of $|x|$

D) None

2) Domain of $y = \sin x$

A) R B) R^+ C) $(0, \infty)$ D) $[-1, 1]$

3) Domain of $y = \cos x$

A) R B) R^+ C) $(0, \infty)$ D) $[-1, 1]$

4) Domain of $y = \tan x$

A) R B) $R - \{n\pi\}$ C) $(0, \infty)$ D) $R - \{2n+1\left(\frac{\pi}{2}\right)\}$

5) Domain of $y = \cot x$

A) R B) $R - \{n\pi\}$ C) $(0, \infty)$ D) $R - \{(2n+1)\frac{\pi}{2}\}$

6) Domain of $y = \operatorname{cosec} x$

A) R B) $R - \{n\pi\}$ C) $(0, \infty)$ D) $R - \{(2n+1)\frac{\pi}{2}\}$

7) Domain of $y = \cancel{\operatorname{cosec}}\ \sec x$

A) R B) $R - \{n\pi\}$ C) $(0, \infty)$ D) $R - \{(2n+1)\frac{\pi}{2}\}$

8) Range of $y = \sin x$

A) R B) $[-1, 1]$ C) $(0, \infty)$ D) $(-1, 1)$

9) Range of $y = \cos x$

A) R B) $[-1, 1]$ C) $(0, \infty)$ D) $(-1, 1)$

10) Range of $y = \tan x$

A) R B) $(0, \infty)$ C) $[-1, 1]$ D) $R - (-1, 1)$

11) Range of $y = \cot x$

A) R B) $(0, \infty)$ C) $[-1, 1]$ D) $R - (-1, 1)$

12) Range of $y = \sec x$

A) $+1 \leq y \leq 1$ B) $-1 \geq y \geq 1$ C) R D) $(0, \infty)$

13) Period of $y = \sin x$

A) π B) 2π 3) 4π D) None

14) Domain of $y = \tan 2x$

A) R B) $R - \{(2n+1)\frac{\pi}{2}\}$ C) $R - \{(2n+1)\frac{3\pi}{2}\}$ D) $R - \{(2n+1)\frac{\pi}{6}\}$

15) Domain of $y = \tan \frac{x}{3}$

A) R B) $R - \{(2n+1)\frac{\pi}{2}\}$ C) $R - \{(2n+1)\pi\}$

D) None

16) Domain of $3\cos 2x$

A) R B) $[-3, 3]$ C) $[0, \infty)$ D) None

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17) Domain of $y = \csc 2x$

A) R B) $R - \{n\pi\}$ C) $R - \{(2n+1)\frac{\pi}{2}\}$ D) $R - \{\frac{n\pi}{2}\}$

18) Range of $y = 2\sec 4x$

A) $-2 < y \leq 2$ B) $-2 \geq y \geq 2$ C) $-1 \geq y \geq 1$ D) $-4 \geq y \geq 4$

19) Period of $3\sec(\frac{1}{3}x)$

A) 2π B) 6π C) 4π D) None

20) Period of $\frac{-3}{4}\cos 5x$

A) $\frac{5\pi}{2}$ B) $\frac{2\pi}{5}$ C) 2π D) None

21) Period of $\sin\left(\frac{x}{4}+\frac{\pi}{2}\right)$

A) 8π B) 2π C) 4π D) None

22) Period of $\frac{3}{2}\cos\left(\frac{x}{4}+\frac{\pi}{2}\right)$

A) 8π B) 6π C) 4π D) None

23) Period of $\sin^2 x$

A) π B) 2π C) $\frac{2\pi}{3}$ D) None

24) Period of $\sin 3x + \cos 4x$

A) 2π B) π C) 4π D) None

25) Period of $\sec 3x + \cot 5x$

A) π B) 2π C) $\frac{\pi}{2}$ D) None

26) frequency of $\sin 3x + \cos 4x$

A) $\frac{1}{2\pi}$ B) $\frac{1}{\pi}$ C) $\frac{1}{4\pi}$ D) None

27) Max of $1+2\cos x$

A) 3 B) 2 C) 1 D) None

28) Min of $1-2\sin x$

A) 1 B) -1 C) 2 D) None

29) Max of $\frac{1}{2}+\frac{3}{2}\cos\left(3x-\frac{5\pi}{4}\right)$

A) $\frac{13}{2}$ B) $\frac{-5}{2}$ C) $\frac{4}{3}$ D) None

30) Amplitude of $3\cos 4x$

A) 2 B) 1 C) 3 D) None

31) Amplitude of $3\sin x+4\cos x$

A) 0 B) $\frac{5}{2}$ C) $\frac{4}{3}$ D) None

32) Max of $\frac{1}{1+2\sin x}$

A) 1 B) $\frac{1}{3}$ C) -1 D) None

33) Min of $6\sin x + 8\cos x$

A) 10 B) -10 C) $\frac{1}{2}$ D) None

34) Max of $\sin x + \cos x$

A) $\sqrt{2}$ B) $-\sqrt{2}$ C) 1 D) None

35) Max of $\frac{12}{3+2\cos x}$

A) 12 B) -12 C) 3 D) None

36) Min of $\frac{14}{7+3\sin x}$

A) $\frac{7}{2}$ B) $\frac{4}{3}$ C) $\frac{5}{7}$ D) None

37) Max of $\frac{1}{3\sin x + 4\cos x}$

A) $\frac{1}{5}$ B) $\frac{-1}{5}$ C) $\frac{1}{2}$ D) None

38) $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

A) 30 B) 60° C) 45° D) None

39) $\sin^{-1}\left(\frac{1}{2}\right) + \cos^{-1}\left(\frac{\sqrt{1}}{1}\right)$

A) 30° B) 45° C) 60° D) None

40) $\cos^{-1}(x)$ is

A) Even fn B) odd fn C) Neither D) None

41) $\cos^{-1}\left(\frac{-1}{2}\right)$

A) 120 B) 60 C) 150 D) None

42) $\sin^{-1}(-x) = -\sin^{-1}(x)$ for $x =$

A) Infinite values B) $[-1, 1]$ C) $[1, -3]$ D) $\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$

43) $\sin^{-1}\left(\frac{-\sqrt{3}}{2}\right)$

A) 90 B) -45 C) -60 D) None

44) $\sin x$ and $\sin^{-1}(x)$ are both

A) Even B) odd C) Even, odd D) None

45) $\text{cosec}^{-1}(-2)$

A) 30 B) -30 C) 45 D) None

46) $\sec^{-1}\left(\frac{-2}{\sqrt{3}}\right)$

A) $\frac{\pi}{6}$ B) $\frac{5\pi}{6}$ C) $\frac{3\pi}{2}$ D) None

47) $\text{Cosec}^{-1}(x) + \text{Sec}^{-1}(x)$

A) π B) $\frac{\pi}{2}$ C) $\frac{\pi}{4}$ D) None

48) $\sin^{-1}(0.03) + \cos^{-1}(0.03)$

A) π B) 0 C) $\frac{\pi}{2}$ D) None

49) $\tan^{-1}(-x) + \cot^{-1}\left(\frac{-1}{x}\right)$

A) π B) $\frac{\pi}{2}$ C) 3π D) None

50) $\sin\left(\frac{\pi}{2} - \cos^{-1}(x)\right)$

A) x B) $\sin x$ C) x^2 D) None

51) $\sin^{-1}(\sin(\pi - \theta))$ → θ (zero)

A) 0 B) π C) 2π D) All

51 | 52 are different Questions → Imp!

52) $\sin^{-1}(\sin(\pi - \theta))$

A) 0 B) π C) 2π D) All

53) $\tan^{-1}\left(\frac{1}{\cot x}\right)$

A) x B) x^2 C) x^3 D) None

54) $2\tan^{-1}(x) =$

A) $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ B) $\tan^{-1}\left(\frac{x}{1-x^2}\right)$ C) $2\tan^{-1}\left(\frac{2x}{1-x^2}\right)$

D) None

55) $\tan^{-1}(x) + \tan^{-1}\left(\frac{1}{x}\right)$

A) 0 B) $\frac{\pi}{2}$ C) 90 D) None

56) what is Cosine of $\cos^{-1}(0.5)$

A) $\frac{1}{6}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$

57) $\sin^{-1}(-1)$

A) -90 B) 270 C) A/B D) None

58) Arc Cos(1)

A) 0 B) 90 C) 270 D) None

59) $\cos^{-1}(-\frac{1}{2})$

A) 120 B) 180 C) 90 D) -45

60) Arc Sec$(-\sqrt{2})$

A) 145 B) -45 C) 135 D) 150

61) $\sin^{-1}(\sin 300)$

A) 45 B) -60 C) 30 D) None

62) The $y = \sin\frac{x}{2}$ has _____ period on interval length of 2π

A) one B) half C) Two D) None

63) $y = \cos 3x$ has _____ periods on an interval of length 2π

64) Amplitude of $y = 1 + 4\cos\left(\frac{x}{3}\right)$

A) 1 B) 4 C) 3 D) 8

65) Solution of $\cos x = \frac{-\sqrt{3}}{2}$

A) $\left\{\frac{5\pi}{6} + 2n\pi\right\} \cup \left\{\frac{7\pi}{6} + 2n\pi\right\}$ B) $\left\{\frac{2\pi}{3} + 2n\pi\right\} \cup \left\{\frac{4\pi}{3} + 2n\pi\right\}$

C) $\left\{\frac{\pi}{3} + 2n\pi\right\} \cup \left\{\frac{\pi}{2} + 2n\pi\right\}$ D) None

66) $\tan\left(\cos^{-1}\left(\frac{1}{2}\right)\right)$

A) $\sqrt{3}$ B) $-\sqrt{3}$ C) $\pm\sqrt{3}$ D) $\frac{1}{\sqrt{3}}$

67) Solutions of $\tan\theta = \frac{\sqrt{3}}{3}$

A) $\left\{\frac{\pi}{6} + n\pi\right\}$ B) $\left\{\frac{2\pi}{3} + 2n\pi\right\}$ C) $\left\{\frac{\pi}{3} + n\pi\right\}$ D) $\left\{\frac{\pi}{4} + n\pi\right\}$

68) Equation $x\sin x = 2x$ is true for x:

A) $\frac{\pi}{2}$ B) $\frac{3\pi}{2}$ C) $\frac{\pi}{4}$ D) 0

69) All values of $\arccos\left(\frac{-1}{2}\right)$

A) $\left\{\frac{\pi}{3} + 2n\pi\right\} \cup \left\{\frac{\pi}{6} + 2n\pi\right\}$ B) $\left\{\frac{2\pi}{3} + 2n\pi\right\} \cup \left\{\frac{4\pi}{3} + 2n\pi\right\}$

C) $\left\{\frac{5\pi}{6} + 2n\pi\right\}$ D) $\left\{\frac{7\pi}{6} + 2n\pi\right\}$ E) None

70) $\cos(\sin^{-1}(x))$

A) $\sqrt{1-x^2}$ B) $-\sqrt{1-x^2}$ C) $\pm\sqrt{1-x^2}$

D) None

71) $\sin^{-1}(\cos^{-1}(x))$

A) $\frac{x}{\sqrt{1-x}}$ B) $\frac{\sqrt{1-x}}{x}$ C) $\sqrt{1-x^2}$ D) None

72) $\sin^{-1}(x) = \frac{\pi}{4}$ then $\cos^{-1}(x)$

A) $\frac{2\pi}{3}$ B) $\frac{3\pi}{4}$ C) $\frac{\pi}{2}$ D) None

73) $\cos^{-1}\frac{\sqrt{3}}{2} + 3\sin^{-1}(\frac{1}{2})$

A) $\frac{2\pi}{3}$ B) $\frac{\pi}{3}$ C) $\frac{4\pi}{3}$ D) $\frac{3\pi}{4}$

74) $\tan^{-1}(\frac{x}{y}) - \tan^{-1}(\frac{x-y}{x+y})$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{4}$

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75) $\cos\left[\tan^{-1}\left[\sin\left(\cot^{-1}(x)\right)\right]\right]$

A) $\sqrt{\frac{x^2+1}{x^2-1}}$ B) $\sqrt{\frac{x^2+1}{x^2+2}}$ C) $\sqrt{\frac{x^2+2}{x^2+1}}$ D) None

76) $\tan^{-1}\left(\frac{1}{5}\right)+\tan^{-1}\left(\frac{1}{7}\right)+\tan^{-1}\left(\frac{1}{3}\right)+\tan^{-1}\left(\frac{1}{8}\right)$

A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{2}$ D) π

77) $\sin^{-1}\left(\sin\frac{5\pi}{3}\right)$

A) $\frac{5\pi}{3}$ B) $\frac{\pi}{3}$ C) $\frac{-\pi}{6}$ D) $\frac{-\pi}{3}$ ✓

78) $\tan^{-1}(3)+\tan^{-1}(x)=\tan^{-1}(8) \rightarrow x=$

A) 5 B) 13 C) 11 D) 15

79) $2\sin^{-1}(x).\cos^{-1}(x)=\frac{\pi}{2}$, $x=$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{1}{2}$ C) $\sqrt{2}$ D) $\frac{1}{\sqrt{2}}$

80) $\tan^{-1}(x) + \tan^{-1}\left(\frac{1}{x}\right)$

A) 45 B) 60 C) 90 D) None