Ravi Maths Tuition

Trigonometric Functions

11th Standard

Mathematics

Multiple Choice Question 48 x 1 = 48

1) In a ΔABC, if ∠A = 45°, ∠B = 60° and ∠C = 75°, then the ratio of sides is _____.

(a) $2 : \sqrt{6} : (\sqrt{3}+1)$ (b) $\sqrt{2} : 6 : (\sqrt{3}+1)$ (c) $2 : \sqrt{6} : (\sqrt{3}-1)$ (d) None

2) In a ΔABC if a = 5, b = 6 and c = 5, then ∠B is _____.

(a) $\cos^{-1}\left(\frac{7}{24}\right)$ (b) $\cos^{-1}\left(\frac{7}{25}\right)$ (c) $\cos^{-1}\left(\frac{7}{30}\right)$ (d) None

3) In a ΔABC, if the sides are 7cm, $4\sqrt{3}$ cm and $.\sqrt{13}$ cm, then the smallest angle is _____.

(a) 45° (b) 60° (c) 30° (d) 90°

4) If x = r sinα cos β, y = r sinα sin $\beta$and z = r cosα, then $X^2 + y^2 + Z^2$ is independent of _____.

(a) α, β (b) γ, α (c) γ, β (d) none of these

5) $\sin^6\theta + \cos^6\theta + 3\sin^2\theta\cos^2\theta$ is equal to _____.

(a) 0 (b) 1 (c) 4 (d) 2

6) If $\tan\theta + \cot\theta = 5$ then $\tan^3\theta + \cot^3\theta$ is equal to _____.

(a) 135 (b) 140 (c) 110 (d) 90

7) If $\tan\theta + \sec\theta = e^x$ then $\cos\theta$ is equal to _____.

(a) $\frac{e^x+e^{-x}}{2}$ (b) $\frac{e^x-e^{-x}}{2}$ (c) $\frac{e^x-e^{-x}}{e^x+e^x}$ (d) $\frac{2}{e^x+e^{-x}}$

8) If $\tan\theta = \frac{\alpha}{\alpha+1}$ and $\tan\phi = \frac{1}{2\alpha+1}$, then (A+ B) is equal to _____.

(a) 0 (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{2}$

9) In a△ ABC, if tan A +tanB+ tan C = o then cot A cot B cot C is equal to_____.

(a) 6 (b) 3 (c) $\frac{1}{6}$ (d) $\frac{1}{3}$

10) If $\sin\theta + \sin\phi = \alpha$ and $\cos\theta - \cos\phi = b$ then $\tan\frac{\theta-\phi}{2}$ is equal to _____.

(a) $\sqrt{a^2+b^2}$ (b) $-\frac{a}{b}$ (c) $-\frac{b}{a}$ (d) $\frac{1}{\sqrt{a^2-b^2}}$

11) If A, B, C are in A.P. then $\frac{sinA-sinC}{cosC-cosA}$ is equal to _____.

(a) sin B (b) cot B (c) sin 2B (d) cot 2B

12) If $4\sin^2\theta = 1$ then the values of θ are _____.

(a) $2n\pi \pm \frac{\pi}{3}, n \in Z$ (b) $n\pi \pm \frac{\pi}{3}, n \in Z$ (c) $n\pi \pm \frac{\pi}{6}, n \in Z$ (d) $2n\pi \pm \frac{\pi}{6}, n \in Z$

13) The solution of the equation $\cos^2\theta$ -+sinθ+ 1=0lies in the interval _____.

(a) $(\frac{\pi}{4}, \frac{3\pi}{4})$ (b) $(-\frac{\pi}{4}, \frac{3\pi}{4})$ (c) $(\frac{3\pi}{4}, \frac{5\pi}{4})$ (d) $(\frac{5\pi}{4}, \frac{7\pi}{4})$

14) Find the general solutions of$\sqrt{3}$ sin x-cos x =2 _____.

(a) X = $n\pi + \frac{\pi}{6} + (-1)^n\frac{\pi}{2}$ (b) X = $n\pi - \frac{\pi}{6} + (-1)^n\frac{\pi}{2}$ (c) X = $n\pi + \frac{\pi}{6} + (-1)^{n+1}\frac{\pi}{2}$ (d) None

15) If a rapidly spinning wheel is making an angle of say 15 revolutions per second,then this is an example of _____.

(a) smaIl angle (b) obtuse angle (c) large angle (d) None of these

16) In a circle of radius r, an arc of length r will subtend an angle of _____.

(a) r radian (b) 1 radian (c) π radian (d) 2π radian

17) Radian measure of 40°20' is equal to _____.

(a) $\frac{120\pi}{504}$ radian (b) $\frac{121\pi}{540}$ radian (c) $\frac{121\pi}{3}$ radian (d) None of these

18) The minute hand of a watch is 1.5 cm long. The distance travelled by the minute hand in 40 minutes is equal to _____.

(a) 3.28 cm (b) 4.28 cm (c) 5.28 cm (d) 6.28 cm

19) If $\tan\theta = \frac{1}{2}$ and $\tan\phi = \frac{1}{3}$, then the value of $\theta + \phi$ is _____.

(a) $\frac{\pi}{6}$ (b) π (c) 0 (d) $\frac{\pi}{4}$

20) The value of sin(45° + θ) - cos(45° - θ) is _____.

(a) $2\cos\theta$ (b) $2\sin\theta$ (c) 1 (d) 0

21) The value of $\cot\left(\frac{\pi}{4}+\theta\right)\cot\left(\frac{\pi}{4}-\theta\right)$ is _____.

(a) -1 (b) 0 (c) 1 (d) Not defined

22) The value of tan 3A - tan2A - tan A is _____.

(a) tan3A tan2A tanA (b) - tan3A tan2A tanA (c) tan A tan2A - tan2A tan3A - tan3A tanA

(d) None of the above

23) If $\theta + \phi$ = a and tan θ = p tan ϕ, then sin (θ - ϕ is equal to _____.

(a) $\frac{p-1}{p+1}\sin\alpha$ (b) $\frac{p-1}{p+1}\cos\alpha$ (c) $\frac{p-1}{p+1}$ (d) $\frac{p+1}{p-1}$

24) The value of cosl2° + cos84 ° + cos156° + cos132° is _____.

(a) $\frac{1}{2}$ (b) 1 (c) $-\frac{1}{2}$ (d) $\frac{1}{8}$

25) The value of sin 50° - sin 70° + sin10° is _____.

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) 2

26) The value of $\sin\frac{\pi}{18}+\sin\frac{\pi}{9}+\sin\frac{2\pi}{9}+\sin\frac{5\pi}{18}$ is _____.

(a) $\sin\frac{7\pi}{18}+\sin\frac{4\pi}{9}$ (b) 1 (c) $cos\frac{\pi}{6}+\cos\frac{3\pi}{7}$ (d) $\cos\frac{\pi}{9}+\sin\frac{\pi}{9}$

27) $\frac{\cos 4x+\cos 3x+\cos 2x}{\sin 4x+\sin 3x+\sin 2x}$ is equal to _____.

(a) sin 2x (b) cos 3x (c) tan 3x (d) cot 3x

28) The value of $\cos\theta\cdot\cos\frac{\theta}{2}-\cos 3\theta\cdot\cos\frac{9\theta}{2}$ is equal to _____.

(a) $\sin 4\theta\cdot\sin\frac{7\theta}{2}$ (b) $\sin 8\theta$ (c) $\sin 7\theta+\sin 8\theta$ (d) $\sin 7\theta.\sin 8\theta$

29) The value of $\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ}$ is _____.

(a) 1 (b) $\sqrt{3}$ (c) $\frac{\sqrt{3}}{2}$ (d) 2

30) If $\sin\theta + \cos\theta = 1$, then the value of $\sin 2\theta$ is _____.

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) -1

31) If $\tan\theta = \frac{a}{b}$, then $b\cos 2\theta + a\sin 2\theta$ is equal to _____.

(a) a (b) b (c) $\frac{a}{b}$ (d) None of these

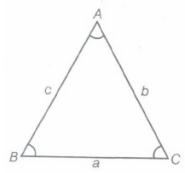
32) The value of $\cos\frac{2\pi}{15}\cos\frac{4\pi}{15}\cos\frac{8\pi}{15}\cos\frac{16\pi}{15}$ is _____.

(a) $\frac{1}{4}$ (b) $\frac{1}{8}$ (c) $\frac{1}{12}$ (d) $\frac{1}{16}$

33) $\sqrt{2+\sqrt{2+\sqrt{2+2\cos 8\theta}}}$ is equal to _____.

(a) cos θ (b) 2cos θ (c) 3cos θ (d) None of these

34) Consider the figure given below



Based on above figure, which among the following statements is true?

I. $\frac{\sin A}{a} = \frac{\sin B}{b}$

II. $\frac{\sin B}{b} = \frac{\sin C}{c}$

III. $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

(a) I is true (b) II is true (c) III is true (d) All are true

35) Let A, B and C be angles of a triangle and a, b and c be lengths of sides opposite to angles A, B and C respectively, then which of the following is/are correct?

I. $a^2 = b^2 + c^2 - 2bc\cos A$

II. $b^2 = c^2 + a^2 - 2ca\cos B$

III. $c^2 = a^2 + b^2 - 2ab\cos C$

(a) I is correct (b) II is correct (c) III is correct (d) All are correct

36) Which among the following is/are called Napier's Analogy in a ΔABC?

(a) $\tan\frac{B-C}{2} = \frac{b-c}{b+c}\cot\frac{A}{2}$ (b) $\tan\frac{C-A}{2} = \frac{c-a}{c+a}\cot\frac{B}{2}$ (c) $\tan\frac{A-B}{2} = \frac{a-b}{a+b}\cot\frac{C}{2}$ (d) All of the above

37) Angles of a triangle are in the ratio 4 : 1 : 1. The ratio between its greatest side and perimeter is _____.

(a) $\frac{3}{2+\sqrt{3}}$ (b) $\frac{1}{2+\sqrt{3}}$ (c) $\frac{\sqrt{3}}{\sqrt{3}+2}$ (d) $\frac{2}{2+\sqrt{3}}$

38) The sides of a triangle are respectively 7 cm, $4\sqrt{3}$ cm and $\sqrt{13}$cm then the smallest angle of the triangle is _____.

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{5}$

39) The radian of 48° 37' 30" is _____.

(a) $\frac{389\pi}{1440}$rad (b) $\frac{389}{1440}$rad (c) $\frac{752\pi}{1440}$rad (d) $\frac{752}{1440}$rad

40) The value of$\cos1°\cos2°\cos3°$ ... $\cos179°$ is _____.

(a) $\frac{1}{\sqrt{2}}$ (b) 0 (c) 1 (d) -1

41) The value of $\sin\frac{\pi}{10}\sin\frac{13\pi}{10}$ is _____.

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) $\frac{1}{4}$ (d) 1

42) If $\tan\theta = \frac{1}{\sqrt{7}}$, then $\left(\frac{\operatorname{cosec}^2\theta - \sec^2\theta}{\operatorname{cosec}^2\theta + \sec^2\theta}\right)$ is equal to _____.

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{5}{4}$ (d) (2)

43) If x = h + asecθ and y = k + bcosecθ. Then, _____.

(a) $\frac{a^2}{(x+h)^2} - \frac{b^2}{(y+k)^2} = 1$ (b) $\frac{a^2}{(x-h)^2} + \frac{b^2}{(y-k)^2} = 1$ (c) $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ (d) $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$

44) If $\tan\theta = \frac{-4}{3}$, then $\sin\theta$ is _____.

(a) $\frac{-4}{5}$ *but* not $\frac{4}{5}$ (b) $\frac{-4}{5}$ *or* $\frac{4}{5}$ (c) $\frac{4}{5}$ *but* not $-\frac{4}{5}$ (d) None of these

45) If $\tan\alpha = \frac{m}{m+1}$ and $\tan\beta = \frac{1}{2m+1}$, then $\alpha+\beta$ is _____.

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{4}$

46) $\frac{(\sin 7x+\sin 5x)+(\sin 9x+3x)}{(\cos 7x+\cos 5x)+(\cos 9x+\cos 3x)}$ is equal to _____.

(a) tan 3x (b) cot 3x (c) tan 6x (d) cot 6x

47) If $\sqrt{3}\cos\theta + \sin\theta = \sqrt{2}$, then θ is equal to _____.

(a) $2m\pi + \frac{5\pi}{12}, m \in Z$ (b) $2m\pi - \frac{\pi}{12}, m \in Z$ (c) Both (a) and (b) are correct

(d) Both (a) and (b) are incorrect

48) In any ΔABC, $\left(\frac{b-c}{a}\right)\cos\frac{A}{2}$ is equal to _____.

(a) $\sin\left(\frac{B-C}{2}\right)$ (b) $\cos\left(\frac{B-C}{2}\right)$ (c) $\sin\left(\frac{A-C}{2}\right)$ (d) $\cos\left(\frac{A-C}{2}\right)$

2 Marks 420 x 2 = 840

49) Find the degree measure of the angle subtended at the centre of a circle of radius 100 cm by an arc of length 22 cm .[use π = 22/7]

50) Find the radian measures corresponding to the following degree measures:
(i) 25° (ii) – 47°30′ (iii) 240° (iv) 520°

51) A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?

52) In a circle of diameter 40 cm, the length of a chord is 20 cm. Find the length of minor arc of the chord.

53) If in two circles, arcs of the same length subtend angles 60° and 75° at the centre, find the ratio of their radii.

54) Find the values of the trigonometric functions sin 765°

55) Find the values of the trigonometric functions cosec (-1410°)

56) Find the values of the trigonometric functions tan $\frac{19\pi}{3}$

57) Find the values of the trigonometric functions $\sin(-\frac{11\pi}{3})$

58) Find the values of the trigonometric functions cot $(\frac{-15\pi}{4})$

59) Prove that: $sin^2\frac{\pi}{6}+cos^2\frac{\pi}{3}-tan^2\frac{\pi}{4}=-\frac{1}{2}$

60) Prove that, $2sin^2\frac{\pi}{6}+cosec^2\frac{7\pi}{6}cos^2\frac{\pi}{3}=\frac{3}{2}$

61) Prove that, $cot^2\frac{\pi}{6}+cosec\frac{5\pi}{6}+3tan^2\frac{\pi}{6}=6$

62) Prove that: $2sin^2\frac{3\pi}{4}+2cos^2\frac{\pi}{4}+2sec^2\frac{\pi}{3}=10$

63) Prove the following: $\cos(\frac{\pi}{4}-x)cos(\frac{\pi}{4}-y)-sin(\frac{\pi}{4}-x)sin(\frac{\pi}{4}-y)=sin(x+y)$

64) Prove the following: $\frac{tan(\frac{\pi}{4}+x)}{tan(\frac{\pi}{4}-x)}=[\frac{1+tanx}{1-tanx}]^2$

65) Prove the following: $\frac{cos(\pi+x)cos(-x)}{sin(\pi-x)cos(\frac{\pi}{2}+x)}=cot^2x$

66) Prove the following: $\cos\ (\frac{3\pi}{2}+x)cos(2\pi+x)\ [cot(\frac{3\pi}{2}+x)+cot(2\pi+x)]=1$

67) Prove the following: sin (n + 1)x sin (n + 2) x + cos (n + 1)x cos (n + 2) x = cos x

68) Prove the following: $cos(\frac{3\pi}{4}+x)-cos(\frac{3\pi}{4}-x)=-\sqrt{2}sinx$

69) Prove the following : $\sin^2$ 6x - $\sin^2$ 4x = sin 2x sin10x

70) Prove the following : $\cos^2$ 2x - $\cos^2$ 6x = sin 4x sin 8x

71) Prove the following : cos 4x = 1 - 8 $\sin^2$ x $\cos^2$ x

72) Prove the following : cos 6x = 32$\cos^6$ x- 48 $\cos^4$ x + 18 $\cos^2$ x-1

73) Prove the following: sin 2x + 2 sin 4x + sin 6x = 4 $\cos^2$ x sin 4x

74) Prove the following: cot x cot 2x - cot 2x cot 3x - cot 3x cot x = 1

75) Prove that : $(\cos x+\cos y)^2+(\sin x-\sin y)^2=4\cos^2\frac{x+y}{2}$

76) Prove that : (sin 3x +sin x) sin x +(cos 3x - cos x) cos x = 0

77) Prove that : $(\cos x-\cos y)^2+(\sin x-\sin y)^2=4\sin^2\frac{x-y}{2}$

78) Convert 40° 20' into radian measure.

79) Convert 6 radians into degree measure.

80) Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm (use $\pi = \frac{22}{7}$).

81) The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes? (Use π = 3.14).

82) If the arcs of the same lengths in two circles subtend angles 65°and 110° at the centre, find the ratio of their radii.

83) If cos x = $-\frac{3}{5}$,x lies in the third quadrant, find the values of other five trigonometric functions.

84) If cot x = $-\frac{5}{12}$, x lies in second quadrant, find the values of other five trigonometric functions.

85) Find the value of sin $\frac{31\pi}{3}$.

86) Find the value of cos (–1710°).

87) Solve $\tan 2x = -\cot\left(x + \frac{\pi}{3}\right)$

88) Convert the following into radians.
240°

89) Convert the following into radians.
25°

90) Convert the following into radians.
-47° 30'

91) Convert the following into radians.
520°

92) Express the following in radians.
40° 20'

93) Find the value of $sin^2\frac{\pi}{6} + cos^2\frac{\pi}{6} + sin^2\frac{\pi}{4}$

94) If cosec $A = \frac{x}{y}$, then find the value of cot A.

95) Prove that $\tan^2\theta - \sin^2\theta = \tan^2\theta\sin^2\theta$

96) If a $cos\theta + bsin\theta = x \quad and \quad asin\theta - bcos\theta = y$,prove that $a^2+b^2=x^2+y^2$.

97) Prove that
$\frac{1+tan^2A}{1+cot^2A} = (\frac{1-tanA}{1-cotA})^2 = tan^2A.$

98) Find the values of sin 75^0

99) Find the value of sin23^0 cos67^0+ cos23^0 sin67^0

100) Express the following in radians.
48° 37' 30''

101) Evaluate sin78^0 cos18^0-cos78^0 sin18^0

102) Prove the following identities.
$(1 + cot\theta - cosec\theta)(1 + tan\theta + sec\theta) = 2$

103) Prove the following identities.
$\frac{tan\theta+sec\theta-1}{tan\theta-sec\theta+1} = \frac{1+sin\theta}{cos\theta}$

104) Find the degree measure corresponding to following radians.
6 rad

105) Prove that
$\frac{sin(A-B)}{cosA\quad cosB} + \frac{sin(B-C)}{cosB\quad cosC} + \frac{sin(C-A)}{cosC\quad cosA} = 0$

106) Prove that sin^2 A = cos^2 (A - B) + cos^2 B - 2 cos (A - B) cos A cos B.

107) Find the degree measure corresponding to following radians.
$\frac{\pi}{64} rad$

108) Find the value of the following trigonometric function.
sin (105º)

109) Find the value of tan105^0

110) Find the length of an arc of a circle of radius 3 cm, if the angle subtended at the centre is 30º .$[\pi = 3.14]$

111) Find the value of the following trigonometric function.
cos (-75º)

112) If $\tan A = \frac{1}{4}$ and $\tan B = \frac{1}{5}$, then find the value of $\tan(A + B)$

113) Find in degrees and radians, the angle between the hour hand and the minute hand of a clock at half past three.

114) Find the value of the following trigonometric function.
tan (435º)

115) Find the value of the following trigonometric function.
sec (105º)

116) Find the value of the following trigonometric function.
sin 15º

117) The minute hand of watch is 1.5 cm long. How far does its tip move in 40 min? [use π =3.14]

118) Evaluate the following.
$sin\frac{\pi}{4}cos\frac{\pi}{12} + cos\frac{\pi}{4}sin\frac{\pi}{12}$

119) Prove that $\frac{cos15^0+sin15^0}{cos15^0-sin15^0} = \sqrt{3}$

120) Find the value of sin 75^0 + sin 15^0

121) Evaluate the following.
$sin\frac{7\pi}{12}cos\frac{\pi}{4} - cos\frac{7\pi}{12}sin\frac{\pi}{4}$

122) Assuming that a person of normal sight can read print at such a distance that the letters subtend an angle of 5' at his eye. What is the height of the letters that he can read at a distance of 12 m?

123) Find the value of $cos\theta \quad and \quad tan\theta$, if $sin\theta = -\frac{3}{5} \quad and \quad \pi < 0 < \frac{3\pi}{2}$.

124) Which of the following is not correct?
$sin\theta = -\frac{1}{5}$
Verify through the range of trigonometric function.

125) Which of the following is not correct?
$cos\theta = 1$
Verify through the range of trigonometric function.

126) Which of the following is not correct?
$sec\theta = \frac{1}{2}$
Verify through the range of trigonometric function.

127) Which of the following is not correct?
$tan\theta = 20$
Verify through the range of trigonometric function.

128) Find the value of $sin\,(45^o + \theta) - cos\,(45^o - \theta)$.

129) Find the value of sin 10^0 + sin 50^0 - sin 70^0

130) Find the general solution of the equation $2\cos^2 x+3\sin x=0$

131) If $tan\alpha = \frac{m}{m+1}$ and $tan\beta = \frac{1}{2m+1}$, then find the value of $\alpha + \beta$

132) If $secx = \frac{13}{5}$, where x lies in fourth quadrant, then find the values of other five trigonometric functions.
(i) Use the transformation table for converting one trigonometric function to another trigonometric function.
(ii) Use the sign table for making the sign.

133) Find the value of tan 3A - tan 2A - tan A.

134) The angles of a triangle are in AP. The number of degrees in the least is to the number of radians in the greatest is as 60: π . Find the angles in degree.

135) In ΔABC , ifa=2, b=3 and sinA=$\frac{2}{3}$, then find $\angle B$.

136) Find the value of the following.
tan 75^o

137) Find the value of tan 15^0

138) If $cos\theta = -\frac{1}{2}$, θ lies in III quadrant, then find other five trigonometric functions.

139) Find the value of the following.
tan $\frac{13\pi}{12}$

140) Prove that $cos6x = 32cos^6x - 48cos^4x + 18cos^2x - 1.$

141) Show that $\sqrt{2+\sqrt{2+\sqrt{2+2cos8\theta}}} = 2cos\theta.$

142) Prove that $sin2x + 2sin4x + sin6x = 4cos^2x.\ sin4x.$

143) Prove (cos A - cos B)^2 + (sin A -sin B)^2 = 4sin^2 $\frac{A-B}{2}$

144) Find the value of $\frac{cot47^0 cot43^0 - 1}{cot47^0 + cot43^0}$

145) Find the general solution for sec x =sec(π+$_x$)

146) Prove that $\frac{\sqrt{3}cos\ \ 23^o - sin\ \ 23^o}{2} = cos\ \ 53^o$.

147) If the arcs of same length in two circles subtend angle of 60° and 75° at their centres. Find the ratio of their radii.

148) Solve the triangle in which
$a = (\sqrt{3}+1), b = (\sqrt{3}-1) \quad and \quad \angle C = 60^0$

149) Prove that $\frac{sin\ \ 5x + sin3x}{cos\ \ 5x + cos\ \ 3x}$=tan 4x

150) If $sin\theta = -\frac{3}{5} and \quad \pi < \theta < \frac{3\pi}{2}$, then find the value of $\frac{sec\theta - cot\theta}{tan\theta - cosec\theta}$.

151) Prove that $\frac{sinx}{cos3x} + \frac{sin3x}{cos9x} + \frac{sin9x}{cos27x} = \frac{1}{2}(tan27x - tanx)$.

152) Prove that sin(n+1) x sin(n+2) x + cos(n+1) x. cos(n+2) x = cosx

153) Show that
$cos\left(\frac{\pi}{4} - \theta\right) cos\left(\frac{\pi}{4} - \phi\right) - sin\left(\frac{\pi}{4} - \theta\right) sin\left(\frac{\pi}{4} - \phi\right) = sin\left(\theta + \phi\right).$

154) Find the degree measure of the angle subtended at the center of a circle of radius 100 cm by an arc of length 22 cm.

155) In $\triangle$ABC, if a=3, b=5 and sin A=$\frac{3}{5}$, find $\angle$ B.

156) In $\triangle$ABC, if A=45^0, B=60^0, and c=75^0, find the ratio of its sides.

157) In a $\triangle$ABC, if a=3, b=4 and c=5, then find angle C.

158) Show that $sin(40^0 + \theta)cos(10^0 + \theta) - cos(40^0 + \theta)sin(10^0 + \theta) = \frac{1}{2}$
Use the formula, sin A cos B-cos A sinB=sin(A-B)and then simplify it.

159) If x is any non-zero real number, show that $cos\theta \quad and \quad sin\theta$ can never be equal to $x + \frac{1}{x}$.

160) If m sinθ = n sin (θ + 2α), then prove that tan (θ + α) cot α = $\frac{m+n}{m-n}$

161) The perimeter of a certain sector of a circle is equal to the length of the arc of a semi-circle having the same radius. Express the angle of the sector in degrees, minute and seconds.

162) In any triangle, if angle are in the ratio 1:2:3, then find their corresponding sides.

163) Prove that tan 15^o + cot15^o = 4.

164) Prove that $cos\left(\frac{3\pi}{4}+x\right)-cos\left(\frac{3\pi}{4}-x\right)=-\sqrt{2}sinx.$

165) In any ΔABC , prove that $\frac{a\sin(B-C)}{b^2-c^2}=\frac{b\sin(C-A)}{c^2-a^2}=\frac{c\sin(A-B)}{a^2-b^2}$

166) In any ΔABC , prove that $\frac{b^2-c^2}{\cos B+\cos C}+\frac{c^2-a^2}{\cos C+A}+\frac{a^2-b^2}{\cos A+\cos B}=0$

167) Find the radius measure corresponding the degree measure 125^0 30'

168) In $\triangle$ABC, if cos A=$\frac{sin\quad B}{2\quad sin\quad C}$, show that the triangle is isosceles.

169) Prove that $sin^2\left(\frac{\pi}{8}+\frac{A}{2}\right)-sin^2\left(\frac{\pi}{8}-\frac{A}{2}\right)=\frac{1}{\sqrt{2}}sin\quad A.$

170) Find the radian measure corresponding to the following degree measures.
75^o

171) Find the radian measure corresponding to the following degree measures.
135^o

172) Find the radian measure corresponding to the following degree measures.
-22^{o}30'

173) Find the radian measure corresponding to the following degree measures.
-300^o

174) Prove that
$\frac{tan\frac{\pi}{4}+x}{tan\frac{\pi}{4}-x}=\left(\frac{1+tanx}{1-tanx}\right)^2$

175) Solve the equation sin θ+sin 3θ+ sin 5θ=0. Taking two terms at a time and then apply the formula sin A+ sin B=2sin($\frac{A+B}{2}$)cos($\frac{A-B}{2}$) to simplify and then find the general solution.

176) Find the degree measure corresponding the radius measure -2^c

177) Prove that $\cos 2\alpha\cos 2\beta+\sin^2(\alpha-\beta)-\sin^2(\alpha+\beta)=\cos 2(\alpha+\beta)$

178) In $\triangle$ABC, if a cos A=b cos B, show that the triangle is either isosceles or right angled.

179) In a $\triangle$ABC, if a=4cm b=5cm, c=6cm, then find cos A, cos B and cos C.

180) If $tan\alpha=\frac{1}{7},sin\beta=\frac{1}{\sqrt{10}}$. Prove that $\alpha+2\beta=\frac{\pi}{4}$, where $0<\alpha<\frac{\pi}{2}\quad and\quad 0<\beta<\frac{\pi}{2}.$

181) Prove that $cosA.cos2A.cos2^2A.cos2^3A...cos2^{n-1}A=\frac{sin2^nA}{2^nsinA}$

182) Find the degree measure corresponding to the following radian measures. $\left[use\pi=\frac{22}{7}\right]$
$\frac{\pi}{9}rad$

183) Find the degree measure corresponding to the following radian measures. $\left[use\pi=\frac{22}{7}\right]$
$\frac{9\pi}{5}$

184) Find the degree measure corresponding to the following radian measures. $\left[use\pi=\frac{22}{7}\right]$
$-\frac{\pi}{3}rad$

185) Find the degree measure corresponding to the following radian measures. $\left[use\pi=\frac{22}{7}\right]$
$-\frac{5\pi}{6}$

186) If cos $(\alpha+\beta)\,sin\,(\Upsilon+\delta)=cos\,(\alpha+\beta)\,sin\,(\Upsilon+\delta)$,then prove that cotα cotβ cotγ = cotδ

187) Find the value of the following trigonometric ratios.

$Sin(\frac{-11\pi}{3})$

188) Find the value of the following trigonometric ratios.

$cot(\frac{-15\pi}{4})$

189) Find the value of the following trigonometric ratios.

$cosec \quad (-1200^0)$

190) Evaluate sin(-1125^0)

(i) Firstly, use the following $cos(-\theta) = cos\theta \quad sin(-\theta) = -sin\theta \quad and \quad tan(-\theta) = -tan\theta$

(ii) Split the given angle in the integral multiple of 360^0 and further solve it.

191) Evaluate sin 930^0

(i) Firstly, use the following $cos(-\theta) = cos\theta \quad sin(-\theta) = -sin\theta \quad and \quad tan(-\theta) = -tan\theta$

(ii) Split the given angle in the integral multiple of 3600 and further solve it.

192) Evaluate cos(-870^0)

(i) Firstly, use the following $cos(-\theta) = cos\theta \quad sin(-\theta) = -sin\theta \quad and \quad tan(-\theta) = -tan\theta$

(ii) Split the given angle in the integral multiple of 3600 and further solve it.

193) Evaluate tan(-2025^0)

(i) Firstly, use the following $cos(-\theta) = cos\theta \quad sin(-\theta) = -sin\theta \quad and \quad tan(-\theta) = -tan\theta$

(ii) Split the given angle in the integral multiple of 3600 and further solve it.

194) $If \quad A + B = \frac{\pi}{4}, then \quad prove \quad that$

(i) (1+tan A)(1+ tan B)=2

(ii) (cot A -1)(cot B-1)=2

195) Find the principal solution of the following trigonometric equations.

$\sec\theta = -\frac{2}{\sqrt{3}}$

196) Find the principal solution of the following trigonometric equations.

$cotx = \frac{1}{\sqrt{3}}$

197) Find the principal solution of the following trigonometric equations.

$\sin x = -\frac{\sqrt{3}}{2}$

198) Find the value of

$sin\left(\frac{25\pi}{3}\right)$

199) Find the value of

$cos\left(\frac{41\pi}{4}\right)$

200) If $\frac{sin(x+y)}{sin(x-y)} = \frac{a+b}{a-b}$ then show that $\frac{sin(x+y)}{sin(x-y)} = \frac{a+b}{a-b}$

201) Find the radian measures corresponding to following degree measures.

5º37' 30''

202) Find the radian measures corresponding to following degree measures.

-14º20' 15''

203) Solve sin mθ+$_{\sin n}\theta$=0

204) If 3 tanA tan B = 1,then prove that 2 cos (A+B) = cos (A−B).

205) The angle of a $\triangle$ABC are in AP and if it is being given that b:c=$\sqrt{3} : \sqrt{2}$, find $\angle A, \angle B$ and $\angle C$

206) In $\triangle$ABC, if $\angle$A=30^0 and b:c=2:$\sqrt{3}$, find $\angle$ B.

207) Solve cos 3x=sin2x

208) Prove that $\frac{cos \quad 4x \quad +cos \quad 3x \quad + \quad cos \quad 2x}{sin \quad 4x \quad +sin \quad 3x \quad + \quad sin \quad 2x} = cot3x$

209) Find the general solution of the following trigonometric equations.
$\sec 2\theta = -2$

210) Find the general solution of the following trigonometric equations.
$\sin 3x = \frac{1}{\sqrt{2}}$

211) Find the general solution of the following trigonometric equations.
$\cos\theta = -\frac{1}{\sqrt{2}}$

212) Find the degree measure corresponding to following radian measures.
$(-3)^c$

213) Find the degree measure corresponding to following radian measures.
11^c

214) Prove that
$cos\frac{\pi}{8} + cos\frac{3\pi}{8} + cos\frac{5\pi}{8} + cos\frac{7\pi}{8} = 0.$

215) Find the value of $\sin 135^0$ $\operatorname{cosec}\ 225^0$ $\tan\ 150^0$ $\cot\ 315^0$.

216) Solve sin3x+cos2x=0

217) If $tan\beta = \frac{tan\alpha + tan\Upsilon}{1 + tan\alpha tan\Upsilon}$,then prove that $sin2\beta = \frac{sin2\alpha + sin2\Upsilon}{1 + sin2\alpha sin2\Upsilon}$.

218) The minute hand of a watch is 1.8 cm long.How far does its trip move in 30 min?

219) In any ΔABC , prove that $\frac{\sin(B-C)}{\sin(B+C)} = \frac{b^2-c^2}{a^2}$

220) In any ΔABC , prove that a sin(B-C)+b sin(C-A)+c sin(A-B)=0.

221) A railroad curve is to be laid out on a circle. What radius should be used , if the track is to change direction by 30^0 is a distance of 50m

222) Prove that
$\frac{sin(x+y)}{sin(x-y)} = \frac{tanx+tany}{tanx-tanx}$

223) If θ is the positive acute angle, then solve the equation $4\cos^2\theta$-$4\sin\theta$=1

224) $Find \sin\theta\ and\ tan\ \theta,\ if\ cos\theta = -\frac{3}{5}\ and\ \theta$ lies in the thrd quadrant

225) Find the length of arc of circle of radius 5cm, subtending a central angle measuring 15^o .

226) Find the angle in degree subtends at the centre of a circle by an arc whose length is 2.2 times the radius.

227) Solve $7\cos^2\theta + 3\sin^2\theta = 4$

228) In any ΔABC , prove that $\sin\left(\frac{B-C}{2}\right) = \left(\frac{b-c}{a}\right)\cos\frac{A}{2}$

229) If $sin\theta + cosec\theta = 2$, then find the value of $sin^2\theta + cosec^2\theta$.

230) If tan x=3/4 and x lies in III quadrant, then find the value of sec x.

231) Evaluate the value of the following
$sec\frac{15\pi}{4}$

232) Evaluate the value of the following
$\sin\ 390^0$

233) Evaluate the value of the following
$\operatorname{cosec}(-1170^0)$

234) Evaluate the value of the following
$\cos\ 135^0$

235) Evaluate the value of the following
$\sec\ 120^0$

236) Find the value of 2sinAcosA, if $A = 22\frac{1_\circ}{2}$.

237) If cos$A = \frac{1}{3}$, then find the value os cos2A.

238) If tan $A = \frac{2}{5}$, then find the value of tan2A.

239) If $3sin\theta = 2cos\theta$, then find the value of $sin2\theta$

240) Find the value of trigonometric ratio $cos22\frac{1_\circ}{2}$.

241) Find the value of trigonometric ratio $tan22\frac{1_\circ}{2}$.

242) If tanA − tanB = x and cot B− cot A = y, then prove that
$cot(A - B) = \frac{1}{x} + \frac{1}{y}$

243) The minute hand of a watch is 2.2 cm long. How far does its tip move in 50 min.

244) A rail road curve is to be laid out on a circle. What radius should be used if the track is to change direction by 25º in a distance of 40 m?

245) Prove that $\frac{cos2A}{sin4A}\ \frac{cos3A}{sin3A}\ \frac{-cos2A}{-sin2A}\ \frac{cos7A+}{sin5A}\ +\ \frac{cosA}{sin4A}\ \frac{cos10A}{sin7A} = cot6A.cot5A$

246) Evaluate the value of the following
cosec150 ^{0}

247) Evaluate the value of the following
tan(-945^0)

248) Evaluate the value of the following
cot 1215^0.

249) Which of the following are correct?
(i) sin1^0 > sin1
(ii) sin1^0
(iii) sin1^0=sin1
(iv) $sin1^0 = \frac{\pi}{180}sin1$

250) Prove the following result.
$2sin^2\frac{\pi}{6} + cosec^2\frac{7\pi}{6}cos^2\frac{\pi}{3} = \frac{3}{2}$

251) In any quadilateral ABCD prove that Cos(A+B)=cos(C+D)

252) If cosec θ+cotθ= $\frac{11}{2}$, then find the value of tanθ

253) If θ is an acute angle and tanθ $= \frac{1}{\sqrt{7}}$ then find the value of $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}$

254) The number of sides of two regular polygons are in the ratio 5:4 and the difference between their angles is in 9º . Find the number of sides of the polygons.

255) Prove that $sec^2\theta + cosec^2\theta \geq 4$.

256) If $cos\theta + sin\theta = \sqrt{2}cos\theta$then prove that $cos\theta - sin\theta = \sqrt{2}sin\theta$.

257) Prove that $\frac{sinx - sin3x}{sin^2x - cos^2x} = 2sinx$.

258) Prove that $\frac{sin2\theta}{1+cos2\theta} = tan\theta$.

259) Prove that $\frac{sin2\theta}{1-cos2\theta} = cot\theta$.

260) Prove that $\frac{1+sin2\theta+cos2\theta}{1+sin2\theta-cos2\theta} = cot\theta$.

261) Prove that $\frac{1-cos2A+sin2A}{1+cos2A+sin2A} = tanA$.

262) A horse is tied to a post by a rope. If the horse moves along circular path always keeping the rope tight and describe 70 m when it has traced out 80° at the centre, find the length of the rope.

263) If 0 ≥ x ≥ π and x lies in the II nd quadrant such that sin x = 1/4 Find the value of cos $\frac{x}{2}$, sin $\frac{x}{2}$ and tan $\frac{x}{2}$

264) In a ΔABC, $\frac{a^2-b^2}{a^2+b^2} = \frac{\sin(A-B)}{\sin A+B}$, prove that it is either a right angled or an isosceles triangle.

265) If $\sin A = \frac{4}{5}$ and $\cos B = \frac{5}{13}$ where $0B = \frac{\pi}{2}$, then find the values of $\sin(A+B)$

266) If $\sin\theta + sin\theta = \sqrt{3}\,(cos\phi - cos\theta)$,Prove that $\sin 3\theta + sin \quad 3\phi = 0$

267) If $\sin A = \frac{4}{5}$ and $\cos B = \frac{5}{13}$ where $0B = \frac{\pi}{2}$, then find the values of $\cos(A+B)$

268) If $\sin A = \frac{4}{5}$ and $\cos B = \frac{5}{13}$ where $0B = \frac{\pi}{2}$, then find the values of $\sin(A-B)$

269) The angle of a triangle are in AP.The number of grades in the least is to the number of radians in the greatest as 40% find the angle in degrees.

270) If $\sin A = \frac{4}{5}$ and $\cos B = \frac{5}{13}$ where $0B = \frac{\pi}{2}$, then find the values of $\cos(A-B)$

271) In ΔABC,if a=18,b=24,c=30, then find cosA,cosB,cosC.

272) If the sides of a ΔABC are a=4, b=6 and c=8, show that 4cosB+3cosC=2

273) Prove that $\frac{cos2\theta}{1+sin2\theta} = tan\left(\frac{\pi}{4} - \theta\right)$.

274) Prove the following results.
$\frac{cos\theta}{1+sin\theta} = tan\left(\frac{\pi}{4} - \frac{\theta}{2}\right)$

275) Prove the following results.
$\frac{cosA}{1-sinA} = tan\left(\frac{\pi}{4} + \frac{A}{2}\right)$

276) Prove that $\frac{sec8\theta-1}{sec4\theta-1} = \frac{tan8\theta}{tan2\theta}$.

277) Find the value of $sin7\frac{1^\circ}{2}$.

278) Prove that $2\cos\frac{\pi}{13}\cos\frac{9\pi}{13} + \cos\frac{3\pi}{13} + \cos\frac{5\pi}{13} = 0$.

279) Show that $\tan(60^0 - \theta)\tan(60^0 - \theta) = \frac{2cos2\theta+1}{2cos2\theta-1}$

280) Prove that $\cos 55^0 + \cos 65^0 + \cos 75^0 = 2\cos 40^0 \cos 35^0$

281) Prove that $\sin 65^0 + \cos 65^0 = \sqrt{2}cos20^0$

282) If a cosθ − b sin θ = c,then show that a sinθ + b cosθ $= \pm\sqrt{a^2+b^2} - c^2$

283) Find the value of the following function.
2 cos 45° sin 15°

284) If x and y are acute angles such that cos x = 13/14 and cos y = 1/7, then prove that x - y =π/3

285) Prove that $\sin 50^0 \cos 85^0 = \frac{1-\sqrt{2}sin \quad 35^0}{2\sqrt{2}}$

286) prove that $\frac{sinA+sinB}{sinA-sinB} = tan\left(\frac{A+B}{2}\right)cot\left(\frac{A-B}{2}\right)$

287) With usual notations, if in a ΔABC, $\frac{b+c}{11} = \frac{c+a}{12} = \frac{a+b}{13}$, then prove that $\frac{\cos A}{7} = \frac{\cos B}{19} = \frac{\cos C}{25}$

288) If sec θ + tan θ = p,obtain the values of sec θ,tan θ and sin θ in terms of p.

289) Solve 4sinxcosx +2sinx+2cosx+1=0

290) Prove that
$2sec^2\theta - sec^4\theta - 2cosec^2\theta + cosec^4\theta$
$= \frac{1 - tan^8\theta}{tan^4\theta}$

291) Find the value of the following function.
$2 \sin 15^o \cos 75^o$

292) Find the value of the following function.
$\cos 315^o \cos 75^o$

293) Find the value of $tan(\alpha+\beta), if \quad cot\alpha = \frac{1}{2}, \alpha\epsilon\left(\pi, \frac{3\pi}{2}\right) and \quad sec\beta = \frac{-5}{3}, \beta\epsilon\left(\frac{\pi}{2}, \pi\right)$

294) Solve the following equation.
$\tan\theta + \tan 2\theta + \sqrt{3}\tan\theta \cdot \tan 2\theta = \sqrt{3}$

295) In a ΔABC, prove that $\left(b^2 - c^2\right)\cot A + \left(c^2 - a^2\right)\cot B + \left(a^2 - b^2\right)\cot C = 0$

296) Prove that sin 7A cos 3A = $\frac{1}{2}$(sin 10A + sin 4A).

297) Prove that
$\sqrt{\frac{1-sin\theta}{1+sin\theta}} = sec\theta - tan\theta, if -\frac{\pi}{2} < \theta < \frac{\pi}{2} - sec\theta + tan\theta, if \frac{\pi}{2} < \theta < \frac{3\pi}{2}$

298) In a ΔABC, prove that $\left(\frac{b^2-c^2}{a^2}\right)\sin 2A + \left(\frac{c^2-a^2}{b^2}\right)\sin 2B + \left(\frac{a^2-b^2}{c^2}\right)\sin 2C = 0$

299) Find the value of 2 sin $52\frac{1^o}{2}$ sin $7\frac{1^o}{2}$

300) \(If\quad sin\quad A=\cfrac { 3 }{ 5 } ,0

301) If cos (α + β) + cos(β + γ) + cos(γ − α) = −3/2,then prove that cos α + cosβ + cosγ = sinα + sinβ + sinγ = 0.

302) If $A + B = \frac{\pi}{4}$ then prove that $(cotA - 1)(cotB - 1) = 2$

303) Find the value of $cos\left(\frac{\pi}{6} - x\right) cos\left(\frac{\pi}{6} + x\right)$.

304) Solve the following equation
$\tan^2\theta + (1-\sqrt{3})\tan\theta - \sqrt{3} = 0$

305) Solve the following equation
$\sec^2 2x = 1 - \tan 2x$

306) If tan(α + θ) = ntan(α − θ) show that (n + 1) sin2θ = (n−1) sin 2α

307) $if \quad a \quad tan\alpha + b \quad tan\beta = (a+b) \quad tan\left(\frac{\alpha+\beta}{2}\right) where \quad \alpha \neq \beta. prove \quad that \quad a \quad cos\beta = b \quad cos\alpha$

308) If sin α + sin β = a and cosα + cosβ = b,then prove that $\sin(\alpha+\beta) = \frac{2ab}{a^2+b^2}$

309) Solve $\sin 3\alpha = 4\sin\alpha\sin(x+\alpha)\sin(x-\alpha)$, where $\alpha \neq n\pi, n \in Z$.

310) Prove that
$cos \quad 2A \quad cos\frac{A}{2} - cos \quad 3A \quad cos\frac{9A}{2} = sin \quad 5A \quad sin \quad \frac{5A}{2}.$

311) If a $\tan\alpha = \frac{1}{\sqrt{x(x^2+x+1)}} \tan\beta = \frac{\sqrt{x}}{\sqrt{x^2+x+1}} and \tan\gamma = \sqrt{x^{-3} + x^{-2} + x^{-1}}$, then prove that α + β = γ

312) Prove that
4cos 12° cos 48° cos 72° = cos 36°.

313) Solve the following trigonometric equations.
$secx - tanx = \sqrt{3}$

314) Prove that sin10° sin 30° sin 50° sin 70° = $\frac{1}{16}$.

315) Find the principal solution of tan x= $\frac{1}{\sqrt{3}}$

316) Find the principal solution of cosec x=-2

317) Find the principal solution of tan x= $\sqrt{3}$

318) If cos A= $\frac{2}{3}$,then find the value of cos 2A

319) Find the value of tan 2A, if tan A= $\frac{5}{12}$

320) Prove that
$tan\ \ \theta\ \ tan\ \ (60^o-\theta)tan\ \ (60^o+\theta)\ \ =\ \ tan\ \ 3\theta.$

321) Find the principal solution of sec x=2

322) Find the principal solution of sin $\frac{3x}{2}$=0

323) Find the principal solution of $\sqrt{2}$ cos x +1=0

324) Find the value of 2 sin A cos A,if A =15^0

325) If asin θ = b cos θ, then find the value of sin 2 θ

326) Find the general solution for cos 3θ= $\frac{-1}{\sqrt{2}}$

327) Find the general solution for sin 5θ=$\frac{1}{\sqrt{2}}$

328) If X = a tan θ, then find the value of cos 2 θ

329) Prove that cos 4x= 1-8 $\sin^2$ X cos ^{2} X.

330) Prove that sinA sin (60^0 - A) sin (60^0 + A)= $\frac{1}{4}$ sin 3A

331) Prove that $tan4x = \frac{4tanx(1-tan^2x)}{1-6tan^2x=tan^4x}$

332) Prove that $cos\frac{2\pi}{15}cos\frac{4\pi}{15}cos\frac{8\pi}{15}cos\frac{16\pi}{15} = \frac{1}{16}$

333) Prove that $\frac{tan3x}{tanx}$ never lies between $\frac{1}{3}$ and 3.

334) Solve tan θ+tan$(\theta+\frac{\pi}{3})$+tan$(\theta+\frac{2\pi}{3})$=3

335) Prove that cot A + cot (60^0 + A) - cot (60^0 - A) = 3cot 3A.

336) If sin A = $\frac{3}{5}$ and A is in I quadrant, then find the values of sin 2A, cos 2A and tan 2A

337) Solve 4sin x sin 2x sin 4x= sin 3x

338) If cos α +cos β = 0 = sin α +sinβ, then find the value of cos2α+cos 2β

339) Find the value of $sin22\frac{1^\circ}{2}$.

340) Prove that $\frac{1+sinA-cosA}{1+sinA+cosA} = tan\frac{A}{2}$.

341) If $tan\frac{\theta}{2} = \sqrt{\frac{1-e}{1+e}}tan\frac{\phi}{2}$, then prove that $cos\phi = \frac{cos\theta-e}{1-ecos\theta}$.

342) If a cosθ+b sinθ=c, then θ=2nπ+$\alpha \pm \beta$, where cos α=$\frac{a}{\sqrt{a^2+b^2}}$,cos β=$\frac{c}{\sqrt{a^2+b^2}}$and sin α=$\frac{b}{\sqrt{a^2+b^2}}$

343) Solve $\sqrt{3}$cosθ+sin θ=1

344) Solve sec x - tan x=$\sqrt{3}$

345) If $\tan x = \frac{3}{4}, \pi < x < \frac{3\pi}{2}$ \)find the value of $sin\frac{x}{2}, cos\frac{x}{2}, tan\frac{x}{2}$.

346) If $cos\theta = \frac{cos\alpha-cos\beta}{1-cos\alpha cos\beta}$, then prove that $tan\frac{\theta}{2} = \pm tan\frac{\alpha}{2}cot\frac{\beta}{2}$.

347) If $cos\theta = cos\alpha cos\beta$, then prove that $tan\frac{\theta+\alpha}{2}tan\frac{\theta-\alpha}{2} = tan^2\frac{\beta}{2}$.

348) If $\alpha\ and\ \beta$ are distinct roots of $acos\theta + bsin\theta = c$, then prove that $sin(\alpha+\beta) = \frac{2ab}{a^2+b^2}$.

349) Prove that $tan6^\circ tan42^\circ tan66^\circ tan78^\circ = 1.$

350) Prove that $16cos\frac{2\pi}{15}.cos\frac{4\pi}{15}.cos\frac{8\pi}{15}.cos\frac{14\pi}{15} = 1.$

351) Find the value of $cos12^\circ + cos84^\circ + cos156^\circ + cos132^\circ.$

352) Evaluate $\lim_{\theta\longrightarrow 0}\theta cosec\theta$

353) Evaluate $\lim_{\theta \longrightarrow 0} \frac{Sin3x}{5x}$

354) Evaluate $\lim_{\theta \longrightarrow 0} \frac{sina\theta}{sinb\theta}$

355) Evaluate $\frac{tan(\theta - b)}{\theta - b}$

356) Evaluate $\lim_{x \longrightarrow 0} \frac{tan \quad x^0}{x^0}$

357) Evaluate $\lim_{x \longrightarrow 0} \frac{sin7x}{tan5x}$

358) Evaluate $\lim_{x \longrightarrow 0} \left(\frac{Sin2x + sin6x}{sin5x - sin3x} \right)$

359) Evaluate $\lim_{x \longrightarrow 0} \frac{1 - cos4x}{x}$

360) Differentiate the following functions cos (x + a)

361) Differentiate the following functions $\frac{sin(x + a)}{cosx}$

362) Evaluate $\lim_{x \longrightarrow 0} \frac{sinax + bx}{ax + sinbx}; a, b, a + b \neq 0.$

363) Evaluate $\lim_{x \longrightarrow 0} \frac{tan \quad 2x - sin2x}{x^3}$

364) Find the derivative of the following functions f(x) = $\sin^2 x$

365) Find the derivative of the following functions f(x) = sin2x

366) Find the derivative of the following functions f(x) = ($\cos^2 x$ - $\sin^2 x$)

367) Find the derivative of following functions x^2 cos x

368) Find the derivative of following functions x^2 sec x

369) Find the derivative of following functions x^2 tan x

370) Differentiate (x + sec x)(x - tan x)

371) Differentiate the following functions 1 - 2 $\sin^2 \frac{x}{2}$

372) Differentiate the following functions $2cos^2 \frac{x}{2} - 1$

373) Differentiate the following functions 3 $\sin \frac{x}{3}$ - 4 $\sin^3 \frac{x}{3}$

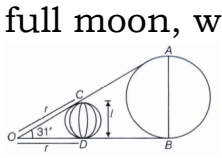
374) Differentiate the following functions $e^{log_e sin \quad x}$

375) Differentiate the following functions $log_e e^{cos \quad x}$

376) Differentiate (ax^2 + sin x) (p + q cos x)

377) Find the derivative of $\frac{4x + 5sinx}{3x + 7cosx}$

378) Find the distance from the eye at which a coin of diameter 2 cm should be held so as just to conceal the full moon, whose angular diameter is 31'



379) A horse is tied to a post by a rope. If the horse moves along a circular path always keeping the rope tight and describe 88 m when it has traced out 54^0 at the centre. Find the length of the rope

380) Find the radian measures corresponding to the following degree measures:-47°30'

381) Find the radian measures corresponding to the following degree measures240°

382) Find the radian measures corresponding to the following degree measures. 520°

383) Find the degree measures corresponding to the following radian measures $(use\ \pi = \frac{22}{7})$ -4

384) Find the degree measures corresponding to the following radian measures $(use\ \pi = \frac{22}{7})\ \frac{5\pi}{3}$

385) Find the degree measures corresponding to the following radian measures $(use\ \pi = \frac{22}{7})\ \frac{7\pi}{6}$

386) Find the angle in radians through which a pendulum swings if its length is 75 cm and the tip describes an arc of length 10cm

387) Find the angle in radians through which a pendulum swings if its length is 75 cm and the tip describes an arc of length 15cm

388) Find the radian measures corresponding to the following degree measures: 50° 45'

389) Find the radian measures corresponding to the following degree measures: -26° 20'

390) Find the radian measures corresponding to the following degree measures: 420°

391) Find the radian measures corresponding to the following degree measures: -1060°

392) Find the radian measures corresponding to the following degree measures: 10° 18' 30".

393) Find the degree measures corresponding to the following radian measures (use π = 22/7).$(\frac{1}{6})^C$

394) Find the degree measures corresponding to the following radian measures (use π = 22/7)-2^c

395) Find the degree measures corresponding to the following radian measures (use π = 22/7)$(\frac{2\pi}{15})^C$

396) Find the degree measures corresponding to the following radian measures (use π = 22/7)$-(\frac{5\pi}{4})^C$

397) Find the degree measures corresponding to the following radian measures (use π = 22/7) $(\frac{44}{9})^C$

398) The difference between two acute angles of a right angled triangle is $\frac{2\pi}{5}$ radians. Find the angles in degrees

399) The difference between two acute angles of a right angled triangle is $\frac{2\pi}{5}$ radians. Find the angles in radians

400) Express the angular measurement of the angle of a regular octagon in degrees and radians.

401) A railway train is travelling on a circular track of 1500 m radius at the speed of 60 km/hr. Through what angle in degrees does it turn in 10 seconds?

402) An athlete runs 4 times around a circular running track to describe 1760 m. What is the angle in (i) radians (ii) degrees subtended at the centre of the circle, after he has run a distance of 308 m?

403) Find the values of other five trigonometric functions cot θ = $\frac{12}{5}$,θ lies in third quadrant

404) Find the values of other five trigonometric functions sinθ = $\frac{3}{5}$,θ lies in third quadrant

405) Find the values of other five trigonometric functions cosθ = $\frac{1}{2}$,θ lies in third quadrant

406) Find the values of other five trigonometric functions tanθ = $\frac{-4}{3}$,θ lies in third quadrant

407) Find the values of the trigonometric function sec$(\frac{25\pi}{3})$

408) Find the values of the trigonometric function $tan(\frac{-17\pi}{6})$

409) Find the values of the trigonometric function $tan(-870^o)$

410) Find the values of the trigonometric function $sin(-750^o)$

411) Find the values of sin 15°

412) Find the values of cos 75^o

413) Find the values of tan 105^o

414) Find the values of sin $\frac{13\pi}{12}$

415) Find the principal and general solutions of the following equations.
tan x =$\sqrt{3}$

416) Find the principal and general solutions of the following equations.
sec x = 2

417) Find the principal and general solutions of the following equations.
cot x = -$\sqrt{3}$

418) Find the general solution for each of the following equations:cosec x = - 2

419) Find the general solution for each of the following equations:
cos 4x = cos 2x

420) Find the general solutions of the following equations sin x = $\frac{1}{3}$

421) Find the general solutions of the following equations cosec x =$-\sqrt{2}$

422) Find the general solutions of the following equations cos x = $\frac{\sqrt{3}}{2}$

423) Find the general solutions of the following equations sec x =$\sqrt{2}$

424) Find the general solutions of the following equations tan $2\theta = \sqrt{3}$

425) Find the general solutions of the following equations tan 3θ = - 1

426) Find the general solutions of the following equations $sin\frac{\theta}{2} = -1$

427) Find the general solutions of the following equations $cos\frac{3\theta}{2} = \frac{1}{2}$

428) Find the general solutions of the following equations $\sqrt{3}sec\,2\theta = 2$

429) Find the general solutions of the following equations $tan\,x = \frac{-1}{\sqrt{3}}$

430) Find the general solutions of the following equations:
tan x + tan 2x + $\sqrt{3}$ tan x tan 2x = $\sqrt{3}$

431) Find the general solutions of the following equations:
tan x + tan$(x + \frac{\pi}{3}) + tan(x + \frac{2\pi}{3}) = 3$

432) Find the general solutions of the following equations:
tan x + tan 2x + tan 3x = tan x tan 2x tan 3x

433) A circular wire of radius 7.5 cm is cut and bent so as to lie along the circumfeence of a hoop whose radius is 120 cm. Find in degrees the angle which is subtended at the centre of the hoop.

434) The perimeter of a certain sector of a circle is equal to the length of the arc of a semi-circle having the same radius. Express the angle of the sector in degrees, minutes and seconds.

435) Find the value of cos 15°.

436) In $\triangle ABC$, if a = 25, b = 52 and c = 63, find cos A and sin A.

437) Prove:a (b cos C - c cos B) = $b^2 - c^2$.

438) A horse is tied to a post by a rope. If the horse moves along a circular path always keeping the rope tight and describes 66 m when it has traced out 45° at the centre, find the length of the rope.

439) Find the value of sin 75°.

440) If 2 tanβ+ cot β= tanα, prove that cotβ=2tan$(\alpha - \beta)$

441) Prove that $\frac{sin(x+\theta)}{sin(x+\phi)} = cos(\theta-\phi) + cot(x+\phi)sin(\theta-\phi)$

442) Prove that $\frac{sinA+sinB}{cosA+cosB}$=$tan(\frac{A+B}{2})$

443) If sinθ = n sin (θ + 2α.), prove that tan (θ+α)= $(\frac{1+n}{1-n})tan\alpha$

444) Find the following values: cos 18°

445) Find the following values: cos 36°

446) Find the following values: sin 36°

447) Find the principal solutions of the equation sin x = $\frac{\sqrt{3}}{2}$

448) Find the principal solutions of the equation tan x = $-\frac{1}{\sqrt{3}}$

449) Find the solution of sin x = $-\frac{\sqrt{3}}{2}$

450) Solve cos x = $-\frac{1}{2}$

451) Solve sin 2x – sin 4x + sin 6x = 0.

452) Solve 2 cos2 x + 3 sin x = 0

453) Evaluate the value of the following.
sin 690°

454) Evaluate cos 47°cos 13° - sin 47°sin 13°

455) Directions Convert each of the following products into the sum or difference of sines and cosines
$2\cos 22\frac{1^\circ}{2} \cdot \cos 67\frac{1^\circ}{2}$

456) Directions Convert each of the following products into the sum or difference of sines and cosines
$\sin\frac{5\pi}{12}\sin\frac{\pi}{12}$

457) Directions Convert each of the following products into the sum or difference of sines and cosines
$2\sin 5\theta\cos\theta$

458) Directions Convert each of the following products into the sum or difference of sines and cosines
$2\cos 4\theta\cos 3\theta$

459) Directions Convert each of the following products into the sum or difference of sines and cosines
$2\sin 3\theta\sin\theta$

460) Directions Convert each of the following products into the sum or difference of sines and cosines
sin 75°cos 15°

461) Directions Convert each of the following products into the sum or difference of sines and cosines
cos 75° cos 15°

462) Directions Express each of the following as a product
$\sin 4\theta + \sin 2\theta$

463) Directions Express each of the following as a product
$\sin 6\theta - \sin 2\theta$

464) Directions Express each of the following as a product
$\cos 4\theta + \cos 8\theta$

465) Directions Express each of the following as a product
$\cos 6\theta - \cos 8\theta$

466) Find the principal solution of the following equations. sec x=-2

467) Prove the following identities.
(i) $\frac{\sin^3 x+\cos^3 x}{\sin x+\cos x}+\frac{\sin^3 x-\cos^3 x}{\sin x-\cos x}=2$
(ii) $\operatorname{cosec}\theta(\sec\theta-1)-\cot\theta(1-\cos\theta)=\tan\theta-\sin\theta$
(iii) $\frac{\tan^3\theta}{1+\tan^2\theta}+\frac{\cot^3\theta}{1+\cot^2\theta}=\frac{1-2\sin^2\theta\cos^2\theta}{\sin\theta\cos\theta}$
(iv) $1-\frac{\sin^2\theta}{1+\cot\theta}-\frac{\cos^2\theta}{1+\tan\theta}=\sin\theta\cos\theta$

468) Prove that
$\frac{\sin(x+\theta)}{\sin(x+\phi)}=\cos(\theta-\phi)+\cot(x+\phi)\sin(\theta-\phi)$

3 Marks 114 x 3 = 342

469) Find the degree measures corresponding to the following radian measures $(use\ \pi=\frac{22}{7})$
(i) $\frac{11}{16}$ (ii) -4 (iii) $\frac{5\pi}{3}$ (iv) $\frac{7\pi}{6}$

470) Find the value of: (i) sin 75° (ii) tan 15°

471) Prove the following:
$\frac{sin5x+sin3x}{cos5x+cos3x}=tan4x$

472) Prove the following:
$\frac{sin\ x-sin\ y}{cos\ x+cos\ y}=\tan(\frac{x-y}{2})$

473) Prove the following:
$\frac{sin\ x+sin\ 3x}{cos\ x+cos\ 3x}=\tan 2x$

474) Prove the following:
$\frac{sinx-sin3x}{sin^2x-cos^2\ x}=2\sin x.$

475) Prove the following:
$\frac{cos\ 4x+cos\ 3x+cos\ 2x}{sin\ 4x+sin3\ x+sin\ 2x}=\cot 3x$

476) Prove the following: tan x = $\frac{4\tan x(1-\tan^2\ x)}{1-6\ \tan^2\ x+\tan^4\ x}$

477) Prove that,
$2\cos\frac{\pi}{13}\cos\frac{9\pi}{13}+\cos\frac{3\pi}{13}+\cos\frac{5\pi}{13}=0$

478) Prove that : sin x + sin 3x + sin 5x + sin 7x = 4 cos x cos2x sin 4x

479) prove that:
$\frac{(sin\ 7x+sin5x)+(sin9x+sin3x)}{(cos7x+cos5x)+(cos9x+cos3x)}=\tan 6x$

480) Prove that : sin 3x+sin 2x-sin x= 4sinxcos$\frac{x}{2}cos\frac{3x}{2}$

481) Prove that
$3\sin\frac{\pi}{6}\sec\frac{\pi}{3}-4\sin\frac{5\pi}{6}\cot\frac{\pi}{4}=1$

482) Find the value of sin 15°.

483) Find the value of tan $\frac{13\pi}{12}$

484) Prove that
$\frac{\sin(x+y)}{\sin(x-y)}=\frac{\tan x+\tan y}{\tan x-\tan y}$

485) Show that tan 3 x tan 2 x tan x = tan 3x – tan 2 x – tan x.

486) Prove that
$\cos\left(\frac{\pi}{4}+x\right)+\cos\left(\frac{\pi}{4}-x\right)=\sqrt{2}\cos x$

487) Prove that $\frac{\cos 7x+\cos 5x}{\sin 7x-\sin 5x}=\cot x$

488) Prove that $=\frac{\sin 5x-2\sin 3x+\sin x}{\cos 5x-\cos x}=\tan x$

489) If $\sin x=\frac{3}{5},\cos y=-\frac{12}{13}$ where x and y both lie in second quadrant,find the value of sin (x + y).

490) Prove that
$\cos 2x \cos \frac{x}{2} - \cos 3x \cos \frac{9x}{2} = \sin 5x \sin \frac{5x}{2}$

491) Find the value of $\tan \frac{\pi}{8}$.

492) If $\tan x = \frac{3}{4}, \pi < x < \frac{3\pi}{2}$, find the value of $\sin \frac{x}{2}, \cos \frac{x}{2}$ and $\tan \frac{x}{2}$

493) Prove that
$\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$

494) If cos A= $\frac{4}{5}$ and cos B= \(\frac { 12 }{ 13 } ;\frac { 3\pi }{ 2 } then find the value of the following.
cos (A + B)

495) If cos A= $\frac{4}{5}$ and cos B= \(\frac { 12 }{ 13 } ;\frac { 3\pi }{ 2 } then find the value of the following.
sin(A - B)

496) If sin A=$\frac{3}{5}$, $0\frac{\pi}{2}$ and cos B=$-\frac{12}{13}$, $\pi\ \frac{3\pi}{2}$, then find the following.
sin (A - B)

497) If sin A=$\frac{3}{5}$, $0\frac{\pi}{2}$ and cos B=$-\frac{12}{13}$, $\pi\ \frac{3\pi}{2}$, then find the following.
cos (A + B)

498) If sin A=$\frac{3}{5}$, $0\frac{\pi}{2}$ and cos B=$-\frac{12}{13}$, $\pi\ \frac{3\pi}{2}$, then find the following.
tan (A - B)

499) In any △ABC, prove that $\frac{sin(C-A)}{sin(C+A)} = \frac{c^2-a^2}{b^2}$

500) In any △ABC, prove that $\frac{a-b}{c} cos \frac{C}{2} = sin \frac{A-B}{2}$.

501) Find the general solution of the equation
$\sec^2 2x = 1 - \tan 2x$

502) In any △ABC, prove that $\frac{b-c}{b+c} = \frac{tan\frac{1}{2}(B-C)}{tan\frac{1}{2}(B+C)}$

503) If $tan\ \beta = \frac{nsin\ \alpha cos\ \alpha}{1-nsin^2\alpha}$, then show that $tan\ (\alpha - \beta) = (1-n)\, tan\ \alpha$.

504) Solve sin2x-sin4x+sin6x=0

505) Solve $\tan^3 x - 3\tan x = 0$

506) In any △ABC, prove that $a(cos\ C - cos\ B) = 2(b-c)cos^2 \frac{A}{2}$

507) Solve $\cos \theta + \sqrt{3} sin\theta = 1$

508) Solve $\sqrt{3} cos\theta + sin\theta = \sqrt{2}$

509) If $cos\,(\alpha+\beta) = \frac{4}{5}$, $sin(\alpha-\beta) = \frac{5}{13}$ and α, β lie between 0 and $\frac{\pi}{4}$ then prove that $tan2\alpha = \frac{56}{33}$.

510) In any △ABC, prove that $(a-b)^2 cos^2 \frac{C}{2} + (a+b)^2 sin^2 \frac{C}{2} = c^2$

511) Solve $\sqrt{2} sec\theta + tan\theta = 1$

512) Find the general solution of $\tan\theta + \tan 2\theta = 1$

513) The Moon's distance from the Earth is 360000 km and its diameter subtend an angle of 31' at the eye of observer. Find the diameter of the Moon.

514) If the angular diameter of Moon is 30', how far from the eye a coin of diameter 2.2 cm be kept to hide the Moon?

515) If the arc of the same length in two circles subtend angles 65° and 110° at the centre, find the ratio of their radii.

516) Find the diameter of the sun in km supposing that it subtends an angle 32' at the eye of the observer. Given that distance of the sun is 91×10^6 km.

517) Find the general solution of cot x+tan x=2

518) If cotx=-5/12, x lies in II quadrant, then find the value of other five trigonometric functions.

519) If secx=-2 and \(\pi , then find the values of all other five trigonometric functions.

520) Prove that tan 315^0 cot(-405^0)+cot 495^0 tan(-585^0)=2

521) If $\theta + \phi = \alpha$ and $tan\theta = k\ tan\quad\phi$, then prove that $sin\,(\theta - \phi) = \frac{k-1}{k+1} sin\alpha$.

522) Find the number of values of x in the interval [0,5π] satisfying the following equation. $3\sin^2x-7\sin x+2=0$

523) If tan(πcosθ)=cot(πsinθ) then prove that $cos\left(\theta - \frac{\pi}{4}\right) = \pm\frac{1}{2\sqrt{2}}$.

524) Find the general solution $\sec^2 2x=1-\tan 2x$

525) Prove that $cot^4\theta + cot^2\theta = cosec^4\theta - cosec^2\theta$

526) Prove that $2sec^2\theta - sec^4\theta - 2cosec^2\theta + cosec^4\theta = cot^4\theta - tan^4\theta$

527) If $cos\,(\theta + \phi) = m\quad cos\quad(\theta - \phi)$then find the value of $\frac{1-m}{1+m} cot\quad\phi$.

528) Show that $\sqrt{\frac{1+sin\theta}{1-sin\theta}} = tan\left(\frac{\pi}{4} + \frac{\theta}{2}\right)$.

529) Prove that $sin4A = 4sinAcos^3A - 4cosAsin^3A$.

530) Prove that $cos4A = 1 - 8cos^2A + 8cos^4A$.

531) Prove that $4cos\theta sin\left(\frac{\pi}{3} + \theta\right) cos\left(\frac{\pi}{3} - \theta\right) = cos3\theta$.

532) If tan θ + sin θ = m and tan θ − sin θ = n,show that $m^2 - n^2 = 4\sqrt{mn}$

533) If $10sin^4\alpha + 15cos^4\alpha = 6$.Find the value of $27cosec^6\alpha + 8sec^6\alpha$.

534) Prove that cos 20^0 cos 40^0 cos 60^0 cos 80^0=$\frac{1}{16}$

535) Prove that sin 20^0 sin 40^0sin 60^0 sin 80^0 = $\frac{3}{16}$

536) If $cos\theta = \frac{-3}{5} and\quad \pi < \theta < \frac{3\pi}{2}$, then find the values of remaining trigonometric functions and hence evaluate $\frac{cosec\theta + cot\theta}{sec\theta - tan\theta}$.

537) Prove that $\sin 150^o \cos 120^o+\cos 330^o \sin 660^o=-1$.

538) Prove that $(cosx - cosy)^2 + (sinx - siny)^2 = 4sin^2\left(\frac{x-y}{2}\right)$.

539) If $2cos\theta = x + \frac{1}{x}$, then prove that $2cos3\theta = x^3 + \frac{1}{x^3}$.

540) If $tanx = \frac{b}{a}$, then find the value of $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}}$.

541) If $2\alpha + 2\beta = 90^\circ$,find the maximum and minimum values of $\sin 2\alpha \sin 2\beta$

542) Prove that cos3A + cos5A + cos 7A + cos15A = 4cos4Acos5Acos6A

543) Prove that $sin\frac{\theta}{2} sin\frac{7\theta}{2} + 2sin\frac{3\theta}{2} sin\frac{11\theta}{2} \quad = sin2\theta sin5\theta$

544) Prove that $cos\frac{\pi}{7} cos\frac{2\pi}{7} cos\frac{4\pi}{7} = \frac{-1}{8}$

545) Prove that $\cos^2\frac{\pi}{8} + \cos^2\frac{3\pi}{8} + \cos^2\frac{5\pi}{8} + \cos^2\frac{7\pi}{8} = 2$

546) If $\alpha + \beta = 90^0$, find the maximum and minimum values of $\sin\alpha\ sin\beta$

547) If $\alpha + \beta = 90^\circ$ then show that maximum value of $\cos\alpha \cos\beta = \frac{1}{2}$

548) If cos x+cos y= $\frac{1}{3}$and sin x+sin y= $\frac{1}{4}$,then prove that an $\left(\frac{x+y}{2}\right) = \frac{3}{4}$

549) Find the value of cos 33^o cos 27^o - cos 57^o cos 63^o .

550) Prove that$\sin^2$ A=$\cos^2$(A-B)+$\cos^2$ B-2 cos(A-B)cos A cos B

551) Find the maximum and minimum values of the trigonometrical expression $12sin\theta - 5cos\theta$

552) Express $3cos\theta - 4sin\theta$ as sine and cosine of a single expression

553) If $cos\alpha + cos\beta + cos\gamma = 0$, then prove that $cos3\alpha + cos3\beta + cos3\gamma = 12cos\alpha cos\beta cos\gamma$

554) Solve the following trigonometric equations.
$\sqrt{3}cosx - sinx = 1$

555) If in any $\triangle$ ABC, a: b: c = 4 : 5 :6, prove that the greatest angle is double the smallest angle.

556) If in a $\triangle$ABC, $\frac{1}{a+b} + \frac{1}{b+c} + \frac{3}{a+b+c}$ prove that c = 60^o

557) In a $\triangle$ABC, if $cosA = \dfrac{\sin B}{2\sin C}$,show that the triangle is isosceles.

558) Prove that $cos^2 A + cos^2(A + \dfrac{2\pi}{3}) + cos^2(A - \dfrac{2\pi}{3}) = \dfrac{3}{2}$

559) $If \quad in \quad \triangle ABC, \frac{tanA - tanB}{tanA + tanB} = \frac{c-b}{c}, prove \quad that \quad A = 60^0$

560) In a ΔABC prove that,
$$\frac{cos^2(\dfrac{B-C}{2})}{(b+c)^2} + \frac{sin^2(\dfrac{B-C}{2})}{(b-c)^2} = a^{-2}$$

561) In any ΔABC,prove that $a^3 sin(B-C) + b^3 sin(C-A) + C^3 sin(A-B) = 0$

562) If $\lim\limits_{x \longrightarrow (-a)} \dfrac{x^7 - (-a)^7}{x - (-a)} = 7$,then find the value of a.

563) If $\lim\limits_{x \longrightarrow b} \dfrac{x^3 - b^3}{x - b} = \lim\limits_{x \longrightarrow 1} \dfrac{x^4 - 1}{x1}$Find all possible value of b.

564) Evaluate $\lim\limits_{x \longrightarrow 1} \dfrac{(x-1)(x+1)(x^2-2)}{(x-1)(x^2-4x-1)} = \dfrac{1}{2}$

565) In a circle of diameter 44 cm, the length of chord is 22 cm. Find the length of minor arc of the chord.

566) Two ships leave a port at the same time. One goes 24Km/h in the direction N 45^0E and other travels 32 km/h in the direction S75^0E. Find the distance between the ships at the end of 3 h.

567) Two trees A and B are on the same side of a river. From a point C in the river the distance of trees A and B are 250m and 300m, respectively of the angle C is 45^0, find the distance between the trees.[use $\sqrt{2} = 1.44$]

568) In any parallelogram, if a and b are the lengths of the two non-parallel sides, θ is the angle measure between there two side and d is the length of the diagonal that has a common vertex with sides a and b, then show that the measure of d can be given by$d^2 = a^2 + b^2 + 2ab\cos\theta$.

569) A tree stands vertically on a hill side which makes an angle of $15^o$with the horizontal. From a point on the ground 35m down the hill from the base of the tree, the angle of elevation of the hop of tree is 60^o. Find the height of the tree.

570) Find the general solution for each of the following equations
cos 3x + cos x - cos 2x = 0

571) Find the general solution for each of the following equations
sin 2x + cos x = 0

572) Find the general solution for each of the following equations:
$\sec^2$ 2x = 1- tan 2x

573) Find the general solution for each of the following equations:
sin x + sin 3x + sin 5x = 0

574) If $\frac{ax}{\cos\theta}+\frac{by}{\sin\theta}=a^2-b^2$ and $\frac{ax\sin\theta}{\cos^2\theta}-\frac{by\cos\theta}{\sin^2\theta}=0$ Prove that $(ax)^{2/3}+(by)^{2/3}=\left(a^2-b^2\right)^{2/3}$

575) In ΔABC, $\angle$B is right angled triangle. If tan A = 1 then show that 2sin A cos A = 1.

576) If $\frac{\tan(\theta+\alpha)}{a}=\frac{\tan(\theta+\beta)}{b}=\frac{\tan(\theta+\gamma)}{c}$, then prove that $\frac{a+b}{a-b}\sin^2(\alpha-\beta)+\frac{b+c}{b-c}\sin^2(\beta-\gamma)+\frac{c+a}{c-a}\sin^2(\gamma-\alpha)=0$

577) Directions Prove each of the following.
$\frac{\cos 3A+2\cos 5A+\cos 7A}{\cos A+2\cos 3A+\cos 5A}=\frac{\cos 5A}{\cos 3A}$

578) Directions Prove each of the following.
$\frac{\sin 3A+\sin 5A+\sin 7A+\sin 9A}{\cos 3A+\cos 5A+\cos 7A+\cos 9A}=\tan 6A$

579) Directions Prove each of the following.
$\frac{\sin 5A\cos 2A-\sin 6A\cos A}{\sin A\sin 2A-\cos 2A\cos 3A}=\tan A$

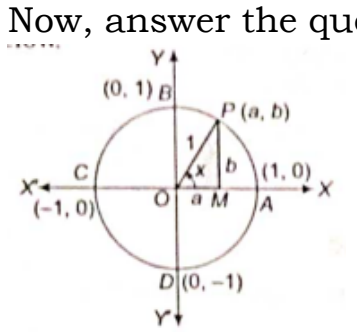
580) A lamp-post is situated at the middle point M of the side AC of a triangular plot ABC with BC= 7m CA = 8 m and AB= 9 m. The lamp-post subtend an angle $\tan^{-1}3$ at the point B. Determine the height of the lamp-post.

581) Prove that
(i) $\frac{\sin(A+B)+\sin(A-B)}{\cos(A+B)+\cos(A-B)}=\tan A$
(ii) $\cos^2 A+\cos^2 B-2\cos A\cos B\cos(A+B)=\sin^2(A+B)$
(iii) $4\cos 12^\circ\cos 48^\circ\cos 72^\circ=\cos 36^\circ$
(iv) $4\cos A\cos(60^\circ-A)\cos(60^\circ+A)=\cos 3A$
(v) $\tan 20^\circ\tan 40^\circ\tan 60^\circ\tan 80^\circ=3$
(vi) $\frac{\cos 8A\cos 5A-\cos 12A\cos 9A}{\sin 8A\cos 5A+\cos 12A\sin 9A}=\tan 4A$

582) Solve the following trigonometric equations.
(i) $3\cos^2\theta+7\sin^2\theta=4$
(ii) $\sin 3x+\cos 2x=0$
(iii) $\tan\left(\frac{\pi}{4}+\theta\right)+\tan\left(\frac{\pi}{4}-\theta\right)=4$
(iv) $\cos 3x+\cos x-2\cos x=0$
(v) $\tan^2 x+\cot^2 x=2$

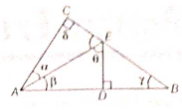
Case Study Questions 2 x 4 = 8

583) Consider thc information given below Let P (a, b) be any point on the unit circle given below, which has its centre at origin O. It is given that $\angle$AOP = x radian.
Now, answer the questions based on the figure given below.



(i) If $a=\frac{\sqrt{3}}{2}$ and $b=\frac{-1}{2}$ then the value of x in radian is
(a) $\frac{\pi}{6}$ **(b)** $\frac{7\pi}{6}$ **(c)** $\frac{5\pi}{6}$ **(d)** $\frac{11\pi}{6}$
(ii) If x = 75°, then the value of tan x is equal to
(a) $2+\sqrt{3}$**(b)** $2-\sqrt{3}$**(c)** $\sqrt{3}+3$**(d)** $\sqrt{2}+1$
(iii) If x = 25°, then the value of x in radian is
(a) $\frac{5\pi}{18}$ **(b)** $\frac{\pi}{18}$ **(c)** $\frac{5\pi}{36}$ **(d)** $\frac{\pi}{36}$
(iv) Which of the following is incorrect?
(a) sin x is positive for 0 < x < π
(b) sin x isnegative for π < x < 2π
(c) cos x is positive for 0 < x < π/2 and 3π/2 < x < 2π
(d) cos x is positive for π/2 < x < 3π/2

584) In the figure, it is given that ∠C = 90°, AD = DB, ED is perpendicular to AB, AB = 20 cm and AC = 12 cm.



Based on the above information, answer the following questions.

(i) The value of $\cos(\alpha+\theta)$ is

(a) $\frac{4}{5}$ **(b)** $\frac{3}{5}$ **(c)** $\frac{117}{125}$ **(d)** $\frac{44}{125}$

(ii) The value of $\tan 2\alpha$ is

(a) $\frac{3}{4}$ **(b)** $\frac{7}{24}$ **(c)** $\frac{336}{527}$ **(d)** $\frac{24}{25}$

(iii) Which of the following is true?

(a) $\gamma+\delta=0+\alpha$ **(b)** $\gamma+\delta>\theta+\alpha$ **(c)** $\gamma+\delta<0+\alpha$ **(d)** $\gamma+\delta<\alpha+\beta$

(iv) The value of $\sin\left(\frac{\alpha+\theta+\gamma+\delta}{2}\right)\sin\left(\frac{\alpha+\theta-\gamma-\delta}{2}\right)$ is

(a) $\frac{4}{5}$ (b) $\frac{3}{5}$ (c) $\frac{117}{125}$ (d) $\frac{-119}{250}$

(v) The value of $\tan\beta+\tan\theta$ is

(a) $\frac{16}{9}$ **(b)** $\frac{12}{25}$ **(c)** $\frac{25}{12}$ **(d)** $\frac{9}{16}$

5 Marks 68 x 5 = 340

585) Find the angle in radian through which a pendulum swings if its length is 75 cm and th e tip describes an arc of length

(i) 10 cm (ii) 15 cm (iii) 21 cm

586) Find the values of other five trigonometric functions cos x = $-\frac{1}{2}$, x lies in third quadrant.

587) Find the values of other five trigonometric functions sin x = $\frac{3}{5}$, x lies in second quadrant.

588) Find the values of other five trigonometric functions cot x = $\frac{3}{4}$,x lies in third quadrant.

589) Find the values of other five trigonometric functions sec x = $\frac{13}{5}$,x lies in fourth quadrant.

590) Find the values of other five trigonometric functions tan x = $-\frac{5}{12}$,x lies in second quadrant.

591) Prove the following: cot 4x (sin 5x +sin 3x) =cot x (sin 5x - sin 3x)

592) Prove the following:
$\frac{cos9x-cos5x}{sin17x-sin3x}=-\frac{sin2x}{cos10x}$

593) Find $\sin\frac{x}{2}, \cos\frac{x}{2} and \tan\frac{x}{2}$ in each of the following: tan x = -$\frac{4}{3}$,x in quadrant II.

594) Find $\sin\frac{x}{2}, cos\frac{x}{2} and\ tan\frac{x}{2}$ in each of the following: cos x = $\frac{-1}{3}$, x x in quadrant III.

595) Find $\sin\frac{x}{2}, cos\frac{x}{2} and\ tan\frac{x}{2}$ in each of the following: sin x = $\frac{1}{4}$,x in quadrant II.

596) In any △ABC, prove that acos A+bcos B+ccos C=2a sin B sin C.

597) Find the general solution of the equation
tanθ+tan2θ+tan3θ= tanθtan2θtan3θ

598) Prove that $cot7\frac{1^\circ}{2}=tan82\frac{1^\circ}{2}=(\sqrt{3}+\sqrt{2})(\sqrt{2}+1)$.

599) Find the value of the expression
$cos^4\frac{\pi}{8}+cos^4\frac{3\pi}{8}+cos^4\frac{5\pi}{8}+cos^4\frac{7\pi}{8}$.

600) Prove that $sin^4\frac{\pi}{8}+sin^4\frac{3\pi}{8}+sin^4\frac{5\pi}{8}+sin^4\frac{7\pi}{8}=\frac{3}{2}$.

601) If $\frac{cos(A-B)}{cos(A+B)}+\frac{cos(C+D)}{cos(C-D)}=0$ then prove that tan A tan B tan C tan D=-1

602) Find the general solution of the equation
sin x- 3sin 2x+sin 3x= cos x -3cos2x+cos 3x

603) Find the general solution of the equation $\sin2\theta+\sin4\theta+\sin6\theta=0$

604) Prove that $cos^3A+cos^3(120^\circ+A)+cos^3(240^\circ+A)=\frac{3}{4}cos3A$.

605) If $A+B+C=180^\circ$, then prove that $cosA+cosB+cosC=1+4sin\frac{A}{2}sin\frac{B}{2}sin\frac{C}{2}$

606) Prove that $cot\theta cot2\theta + cot2\theta cot3\theta + 2 = cot\theta(cot\theta - cot3\theta)$.

607) If $\cos(\theta + \phi) = mcos\,(\theta - \phi)$thenprove that $\tan\,\theta = \frac{1-m}{1+m}cot\phi$

608) If asian θ =bsin $\left(\theta + \frac{2\pi}{3}\right) = csin\left(\theta + \frac{4\pi}{3}\right)$, then prove that ab+bc+ca=0

609) If x $\cos\,\theta = ycos\left(0 + \frac{2\pi}{3}\right) = \quad z \quad cos\left(0 + \frac{4\pi}{3}\right), then \quad show \quad that \quad xy + yz + zx$

610) The angles of a triangle are in A.P. and the greater angle is double the least angle. Find the angles of the triangle in radians.

611) A train is travelling at the rate of 66 km/hr on a circular track of 1500 m radius. Find the angle in degrees through which it turns in 20 seconds.

612) Find the angle in degrees and radians between minutes hand and hour hand of a clock at 7 : 20.

613) Find all other trigonometric ratios if $\sin\,\theta = \frac{-2\sqrt{6}}{5}$ and θ lies in third quadrant.

614) If $\sin\,\theta = \frac{-5}{13}$ and θ lies in third quadrant, find the value of $\sec\,\theta + \tan\,\theta$.

615) If $\sec\,\theta = \sqrt{2}$ and θ lies m fourth quadrant, find the value of $\frac{1+tan\theta+cosec\theta}{1+cot\theta-cosec\theta}$

616) Find the value of $[1 + cos\frac{\pi}{8}][1 + cos\frac{3\pi}{8}][1 + cos\frac{5\pi}{8}][1 + cos\frac{7\pi}{8}]$

617) Find the general solutions of the following equations:
$7\cos^2 X + 3\sin^2 x = 4$

618) Find the general solutions of the following equations:
$4\sin x \sin 2x \sin 4x = \sin 3x$

619) Find the general solutions of the following equations:
$\sec x - 1 = (\sqrt{2} - 1)\tan x$ where $x \pm (2n + 1)\frac{\pi}{2}$, $n \in Z$.

620) Solve the equation: $\cos\,\theta + \cos\,3\theta - 2\cos\,2\theta = 0$.

621) Solve the equation: $\sin\,2\theta + \sin\,4\theta + \sin\,6\theta = 0$.

622) In $\triangle ABC$, prove that
$tan\frac{B-C}{2} = \frac{b-c}{b+c}cot\frac{A}{2}$
$tan\frac{C-A}{2} = \frac{c-a}{c+a}cot\frac{B}{2}$
$tan\frac{A-B}{2} = \frac{a-b}{a+b}cot\frac{C}{2}$

623) In $\triangle ABC$ Prove that $\frac{cosA}{bcosC+c\,cosB} + \frac{cosB}{c\,cosA+acosC} + \frac{cosC}{acosB+bcosA} = \frac{a^2+b^2+c^2}{2abc}$

624) In ,ΔABC,b:c =$\sqrt{3} : \sqrt{2}$and the angles are in A.P find $\angle A$

625) In ,ΔABC, if a=9,b=8 and c=4, prove that 4+3 cos B = 6 cos C

626) In ABC ,if a^2,b^2,c^2 are in A.P., prove that cot A,cot B,cot C are in A.P

627) In any ΔABC, show that a^3 cos (B-C)+b^3 cos (C-A)+c^3 cos (A-B)=3abc

628) In any triangle ABC, prove that $\frac{a^2 sin(B-C)}{sinB+sinC} + \frac{b^2 sin(C-A)}{sinC+sinA} + \frac{c^2 sin(A-B)}{sinA+sinB} = 0$.

629) The angle of elevation of the top point P of the vertical tower PQ of height h from a point A is 45° and from a point B, the angle of elevation is 60°, where B is a point at a distance d from the point A measured along the line AB which makes angle 30° with AQ. Prove that d=$h(\sqrt{3} - 1)$.From fig. we have

630) Two boats leave a place at the same time. One travels 56 km in the direction N 50° E while the other travels 48 km in the direction S 70° E. Find the distance between the new positions of the boats.

631) Given that a = 18, b = 24 and c = 30. Find sin A, sin B and sin C.

632) For any $\triangle ABC$prove that $\frac{a+b}{c} = \frac{cos(\frac{A-B}{2})}{sin\frac{C}{2}}$.

633) For any $\triangle ABC$ prove that $\frac{a-b}{c} = \frac{sin(\frac{A-B}{2})}{cos\frac{C}{2}}$

634) In any ΔABC, prove that $\frac{a^2 sin(B-C)}{sin\ \ A} + \frac{b^2 sin(C-A)}{sin\ \ B} + \frac{c^2 sin(C-A)}{sin\ \ C} = 0$

635) Prove: $sin\frac{B-C}{2} = \frac{b-c}{a} cos\frac{A}{2}$.

636) In any ΔABC,prove that4 $\left(bc\ \ cos^2\frac{A}{c} + ca\ \ cos^2\frac{B}{c} + ab\ \ cos^2\frac{C}{c}\right)$=(a+b+c)^2

637) In any ΔABC, Prove that $\frac{cos^2B-cos^2C}{b+c} + \frac{cos^2C-cos^2A}{c+a} + \frac{cos^2A-cos^2B}{a+b}$

638) In any ΔABC, prove that: $a\ \ sin\frac{A}{2} sin\frac{B-C}{2} + b\ \ sin\frac{B}{2} sin\frac{C-A}{2} + c\ \ sin\frac{C}{2} sin\left(\frac{A-B}{2}\right) = 0$

639) In any ΔABC, if cos A +2 cos B +cos C=2.Prove that the sides of the Δ are in A.P

640) The angles of a triangle are in A.P. The number of grades in the least is to the number of radians in the greatest as 40:π Find the angles in degrees.

641) If cos $\theta = -\frac{1}{2}$ and $\pi < \theta < \frac{3\pi}{2}$, find the value of 4 $\tan^2\theta$- 3 $\text{cosec}^2\ \theta$

642) If cos $(\alpha+\beta)$sin $(\gamma+\delta)$ =cos $(\alpha+\beta)$sin $(\gamma+\delta)$, prove that cotα cotβ cotγ = cotδ.

643) Prove:$a(cosC - cosB) = 2(b-c)cos^2\frac{A}{2}$.

644) Prove: $\frac{sin(B-C)}{sin(B+C)} = \frac{b^2-c^2}{a^2}$.

645) Prove:$(b+c)cos\frac{B-C}{2} = acos\frac{B-C}{2}$.

646) Prove: a cos A + b cos B + C cos C = 2a sin B sin C.

647) Prove: $\frac{cosA}{a} + \frac{cosB}{b} + \frac{cosC}{c} = \frac{a^2+b^2+c^2}{2abc}$.

648) Prove that: $\frac{b^2-c^2}{a^2}.sin2A + \frac{c^2-a^2}{b^2}.sin2B + \frac{a^2-b^2}{c^2} sin2C = 0$

649) Prove that: $\frac{cos6\theta+6cos4\theta+15cos2\theta+10}{cos5\theta+5cos3\theta+10cos\theta} = 2cos\theta$

650) Find the general solution of the trigonometric equation $\sqrt{3}$cosx + sinx =$\sqrt{2}$

651) Find the sin 18°

652) ather of Ashok is a builder, He planned a 12 story building in Gurgaon sector 5. For this, he bought a plot of 500 square yards at the rate of Rs 1000 /yard². The builder planned ground floor of 5 m height,

first floor of 4.75 m and so on each floor is 0.25 m less than its previous floor.

Now Answer the following questions:

What is the height of the last floor?

(a) 2.5 m

(b) 2.75 m

(c) 2.25 m

(d) 3 m

Which floor no is of 3 m height?

(a) 5

(b) 7

(c) 10

(d) 9

What is the total height of the building?

(a) 40 m

(b) 43.5

(c) 40.5 m

(d) 44 m

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