

MATHEMATICS

INTRODUCTION TO TRIGONOMETRY

1. In $\triangle ABC$, $\angle B = 90^\circ$. If $AB = 14$ cm and $AC = 50$ cm then $\tan A$ equals :

- (A) $\frac{24}{25}$ (B) $\frac{24}{7}$ (C) $\frac{7}{24}$ (D) $\frac{25}{24}$

ANS : B

2. If $\sin \theta = \frac{12}{13}$ then the value of the $\frac{2 \cos \theta + 3 \tan \theta}{\sin \theta + \tan \theta \sin \theta}$ is :

- (A) $\frac{12}{5}$ (B) $\frac{5}{3}$ (C) $\frac{259}{102}$ (D) $\frac{259}{65}$

ANS : C

3. If $\sec \theta = \frac{\sqrt{p^2 + q^2}}{q}$ then the value of the $\frac{p \sin \theta + q \cos \theta}{p \sin \theta + q \cos \theta}$ is :

- (A) $\frac{p}{q}$ (B) $\frac{p^2}{q^2}$ (C) $\frac{p^2 - q^2}{p^2 + q^2}$ (D) $\frac{p^2 + q^2}{p^2 - q^2}$

ANS : C

4. If angle A is acute and $\cos A = \frac{8}{17}$ then $\cot A$ is :

- (A) $\frac{8}{15}$ (B) $\frac{17}{8}$ (C) $\frac{15}{8}$ (D) $\frac{17}{15}$

ANS : A

5. $\sec \theta$ is equal to –

- (A) $\frac{1}{\sqrt{1 - \cos^2 \theta}}$ (B) $\frac{\sqrt{1 + \cot^2 \theta}}{\cot \theta}$ (C) $\frac{\cot \theta}{\sqrt{1 + \cot^2 \theta}}$ (D) $\frac{\sqrt{\operatorname{cosec}^2 \theta - 1}}{\operatorname{cosec} \theta}$

ANS : B

6. $\sin 30^\circ + \cos 60^\circ$ equals :

- (A) $\frac{1 + \sqrt{3}}{2}$ (B) $\sqrt{3}$ (C) 1 (D) None of these

ANS : C

7. The value of $2 \tan^2 60^\circ - 4 \cos^2 45^\circ - 3 \sec^2 30^\circ$ is :

- (A) 0 (B) 1 (C) 12 (D) 8

ANS : A

8. The value of $\frac{3}{4} \tan^2 30^\circ - 3 \sin^2 60^\circ + 3 \operatorname{cosec}^2 45^\circ$ is

- (A) 1 (B) 8 (C) 0 (D) 12

ANS : C

9. $7 \sin^2 \theta + 3 \cos^2 \theta = 4$ then :

- (A) $\tan \theta = \frac{1}{\sqrt{2}}$ (B) $\tan \theta = \frac{1}{2}$ (C) $\tan \theta = \frac{1}{3}$ (D) $\tan \theta = \frac{1}{\sqrt{3}}$

ANS : D

10. The solution of the trigonometric equation $\frac{\cos^2 \theta}{\cot^2 \theta - \cos^2 \theta} = 3, 0^\circ < \theta < 90^\circ$:

- (A) $\theta = 0^\circ$ (B) $\theta = 30^\circ$ (C) $\theta = 60^\circ$ (D) $\theta = 90^\circ$

ANS : C

11. If $\cot \theta + \cos \theta = p$ and $\cot \theta = q$, then the value of $p^2 - q^2$ is :

- (A) $2\sqrt{pq}$ (B) $4\sqrt{pq}$ (C) $2pq$ (D) $4pq$

ANS : B

12. The value of $\sin^2 15^\circ + \sin^2 30^\circ + \sin^2 45^\circ + \sin^2 60^\circ + \sin^2 75^\circ$ is :

- (A) 1 (B) $\frac{3}{2}$ (C) $\frac{5}{2}$ (D) 3

ANS : C

13. The value of $\frac{\sin 29^\circ}{\cos 61^\circ} - \frac{\sin 61^\circ}{\cos 29^\circ}$ is :

- (A) Zero (B) 1 (C) $\frac{61}{29}$ (D) $\frac{29}{61}$

ANS : A

14. The values of x and y which make the following solutions true are: $\cos x^\circ = \sin 52^\circ$ and $\cos y^\circ = \sin (y^\circ + 10)$

- (A) $x = 52^\circ, y = 30^\circ$ (B) $x = 38^\circ, y = 40^\circ$ (C) $x = 48^\circ, y = 52^\circ$ (D) $x = 40^\circ, y = 50^\circ$

ANS : B

15. If $\alpha + \beta = 90^\circ$ and $\alpha = 2\beta$ then $\cos^2 \alpha + \sin^2 \beta$ equal :

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

ANS : C

16. A flagstaff 6 metres high throws shadow $2\sqrt{3}$ metres long on the ground. The angle of elevation is :

- (A) 30° (B) 45° (C) 90° (D) 60°

ANS : D

17. An observer $\sqrt{3}$ m tall is 3 m away from the pole $2\sqrt{3}$ m high. The angle of the top of elevation of the top from the pole is :

- (A) 45° (B) 30° (C) 60° (D) 15°

ANS : B

18. An observer 1.5 m tall is 28.5 m away from. a chimney. The angle of elevation of the top of the chimney from her eyes is 45° . The height of the chimney is :

- (A) 30 m (B) 27 m (C) 28.5 m (D) None of these

ANS : A

19. The angle of elevation of the top of a tower from a distance 100 m from its foot is 30° . The height of the tower is :

- (A) $1000\sqrt{3}$ m (B) $\frac{200}{\sqrt{3}}$ m (C) $5\sqrt{3}$ m (D) $\frac{100}{\sqrt{3}}$ m

ANS : D

20. A kite is flying at a height of 60 m above the ground. The sting attached to the kite is temporarily the to a point on the ground. The inclination of the string with the ground is 60° . The length of the string is :

- (A) $40\sqrt{3}$ m (B) 30 m (C) $20\sqrt{3}$ m (D) $60\sqrt{3}$ m

ANS : A

21. A tree is broken by the wind. Its top struck the ground at an angle 30° at a distance of 30 m from its foot. The whole height of the tree is :

- (A) $10\sqrt{3}$ m (B) $20\sqrt{3}$ m (C) $40\sqrt{3}$ m (D) $30\sqrt{3}$ m

ANS : D

22. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° respectively. If the bridge is at a height of 3 m from the banks then the width of the river is :

- (A) $3(\sqrt{3}-1)$ m (B) $3(\sqrt{3}+1)$ m (C) $(\sqrt{3}+3)$ m (D) $(\sqrt{3}-3)$ m

ANS : B

23. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. The height of the tower is :

- (A) $\sqrt{5}$ m (B) $\sqrt{13}$ m (C) 6 m (D) 2.25 m

ANS : C

24. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angles of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. The distance he walked towards the building is :

- (A) $19\sqrt{3}$ m (B) $57\sqrt{3}$ m (C) $38\sqrt{3}$ m (D) $18\sqrt{3}$ m

ANS : A

25. As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of two ships are 30° and 60° . if one ship is exactly behind the other on the same side of the light-house then the distance between the two ships is :

- (A) $25\sqrt{3}$ m (B) $75\sqrt{3}$ m (C) $50\sqrt{3}$ m (D) None of these

ANS : C

26. If $\frac{ax}{\cos \theta} + \frac{by}{\sin \theta} = a^2 - b^2$ and $\frac{ax \sin \theta}{\cos^2 \theta} - \frac{by \cos \theta}{\sin^2 \theta} = 0$ then $(ax)^{2/3} + (by)^{2/3}$ is equal to :

- (A) $(a^2 - b^2)^{2/3}$ (B) $(a^2 + b^2)^{2/3}$ (C) $(a - b)^{2/3}$ (D) None of these

ANS : A

27. The sides of a right angled triangle form a geometric progression, find the cosines of the acute angles. (If a, b, c are in G.P. $\Rightarrow b^2=ac$):

(A) $\frac{\sqrt{5}-1}{2}$ and $\sqrt{\frac{\sqrt{5}+1}{2}}$

(B) $\frac{\sqrt{5}+1}{2}$ and $\sqrt{\frac{\sqrt{5}+1}{2}}$

(C) $\frac{\sqrt{5}-1}{2}$ and $\sqrt{\frac{\sqrt{5}-1}{2}}$

(D) None of these

ANS : C

28. If $y = \frac{2 \sin \alpha}{1 + \cos \alpha + \sin \alpha}$, then $\frac{1 - \cos \alpha + \sin \alpha}{1 + \sin \alpha}$ is equal to :

(A) $1+y$

(B) $1-y$

(C) $\frac{1}{y}$

(D) None of these

ANS : D

29. $\cot 36^\circ \cot 72^\circ$ is equal to :

(A) $\frac{1}{5}$

(B) $\frac{1}{\sqrt{5}}$

(C) 1

(D) None of these

ANS : B

30. The value of $\cos^2 15^\circ - \cos^2 30^\circ + \cos^2 45^\circ - \cos^2 60^\circ + \cos^2 75^\circ$ is :

(A) 2

(B) 0

(C) $\frac{1}{4}$

(D) $\frac{1}{2}$

ANS : D

31. If $x = \sin^2 \theta \cos \theta$ and $y = \cos^2 \theta \sin \theta$, then :

(A) $(x^2 y)^{2/3} + (x y^2)^{2/3} = 1$

(B) $\left[\frac{x^2}{y}\right]^{2/3} + \left[\frac{y^2}{x}\right]^{2/3} = 1$

(C) $x^2 + y^2 = x^2 y^2$

(D) None of these

ANS : B

32. If $x = \sec \theta - \tan \theta$ and $y = \operatorname{cosec} \theta + \cot \theta$, then $xy + 1$ is equal to :

(A) $x+y$

(B) $x-y$

(C) $2x+y$

(D) $y-x$

ANS : D

33. If $5 \sin \theta = 3$, then $\frac{\sec \theta + \tan \theta}{\sec \theta - \tan \theta}$ is equal to :
- (A) $\frac{1}{4}$ (B) 4 (C) 2 (D) None of these

ANS : B

34. The value of the expression $1 - \frac{\sin^2 y}{1 + \cos y} + \frac{1 + \cos y}{\sin y} - \frac{\sin y}{1 - \cos y}$ is equal to :
- (A) $\cos y$ (B) 1 (C) 0 (D) $\sin y$

ANS : A

35. If $\sec \theta = x + \frac{1}{4x}$, $x \in R, x \neq 0$, then the value of $\sec \theta + \tan \theta$ is :
- (A) $2x$ (B) $\frac{1}{2x}$ (C) $2x$ or $\frac{1}{2x}$ (D) None of these

ANS : C

36. If $\tan \theta = \frac{p}{q}$, then the value of $\frac{p \sin \theta - q \cos \theta}{p \sin \theta + q \cos \theta}$ is :
- (A) $\frac{p^2 - q^2}{p^2 + q^2}$ (B) $\frac{p^2 + q^2}{p^2 - q^2}$ (C) 0 (D) None of these

ANS : A

37. If $m = \tan \theta + \sin \theta$ and $n = \tan \theta - \sin \theta$, then $(m^2 - n^2)^2$ is equal to :
- (A) mn (B) $4mn$ (C) $16mn$ (D) $4\sqrt{mn}$

ANS : C

38. If $x = \cos \theta + b \sin \theta$ and $y = a \sin \theta + \cos \theta$ then $a^2 + b^2$ is equal to :
- (A) $x^2 - y^2$ (B) $x^2 + y^2$ (C) $(x + y)$ (D) None of these

ANS : B

39. If $\cos \theta + \frac{y}{b} \sin \theta + 1 = 0$ and $\frac{x}{a} \sin \theta - \frac{y}{b} \cos \theta - 1 = 0$ then $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ is equal to :
- (A) 2 (B) 0 (C) -2 (D) 1

ANS : A

40. ABC is a triangle, right angled at A. If the length of hypotenuse is $2\sqrt{2}$ times the length of perpendicular from A on the hypotenuse, the other angles of the triangle are :

- (A) $22.5^\circ, 67.5^\circ$ (B) $30^\circ, 60^\circ$ (C) $45^\circ, 45^\circ$ (D) None of these

ANS : A

41. If $\sin A + \cos A = m$ and $\sin^3 A + \cos^3 A = n$, then :

- (A) $m^3 + 3m + 2n = 0$ (B) $m^3 - 3m + 2n = 0$
(C) $n^3 - 3n + 2m = 0$ (D) $m^3 - 3m + n = 0$

ANS : B

42. If $\sin^2 \theta + 3\cos \theta - 2 = 0$, then $\cos^3 \theta + \sec^3 \theta$ is equal to :

- (A) 18 (B) 9 (C) 4 (D) $\frac{1}{4}$

ANS : A

43. If $\sin \alpha + \cos \alpha = a$, then $\sin^6 \alpha + \cos^6 \alpha$ is equal to :

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

ANS : B

44. The quadratic equation whose roots are $\sin 18^\circ$ and $\cos 36^\circ$ is :

- (A) $4x^2 + 2\sqrt{5}x + 1 = 0$ (B) $4x^2 - 2\sqrt{5}x - 1 = 0$
(C) $x^2 + 2\sqrt{5}x + 1 = 0$ (D) $4x^2 - 2\sqrt{5}x + 1 = 0$

ANS : D

45. If $\cos \theta + \sec \theta = 2$, then the value of $\cos^2 \theta + \sec^2 \theta$ is :

- (A) 1 (B) 2 (C) 4 (D) None of these

ANS : C

46. If $\sin(A - B) = \cos(A + B) = \frac{1}{2}$, then the values of A and B lying between 0° and 90° are respectively:

- (A) 30° and 60° (B) 60° and 30° (C) 45° and 15° (D) None of these

ANS : C

47. If $0 \leq x \leq \frac{\pi}{2}$ and $81^{\sin 2x} + 81^{\cos 2x} = 30$, then x is equal to :

- (A) $\frac{\pi}{3}$ or $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$ or 0 (C) $\frac{\pi}{2}$ or $\frac{\pi}{4}$ (D) None of these

ANS : A

48. If $m^2 + m'^2 + 2mn' \cos \theta = 1, n^2 + n'^2 + 2nn' \cos \theta = 1$, and $mn + m'n' + (mn' + m'n) \cos \theta = 0$, then $m^2 + n^2$ is equal to :

- (A) $\sin^2 \theta$ (B) $\cos^2 \theta$ (C) $\cos^2 \theta$ (D) None of these

ANS : B

49. If $\frac{\sin A}{\sin B} = p$ and $\frac{\cos A}{\cos B} = q$, then tan A is equal to :

- (A) $\pm \frac{p}{q} \sqrt{\frac{q^2 - 1}{1 - p^2}}$ (B) $\pm \sqrt{\frac{q^2 - 1}{1 - p^2}}$ (C) $\pm \frac{p}{q} \sqrt{\frac{q^2 - 1}{1 - p^2}}$ (D) None of these

ANS : A

50. If $T_n = \sin^n \theta + \cos^n \theta$, then $\frac{T_3 - T_5}{T_1}$ is equal to :

- (A) $\frac{T_5 - T_7}{T_3}$ (B) $\frac{T_3 - T_5}{T_7}$ (C) $\frac{T_9 - T_6}{T_4}$ (D) $\frac{T_6 - T_9}{T_4}$

ANS : A

51. The number of values of θ which lie between 0 and $\frac{\pi}{2}$ and satisfy the equation $\sin^4 \theta - 2\sin^2 \theta - 1 = 0$ is :

- (A) 1 (B) 2 (C) 3 (D) None of these

ANS : D

52. The greatest angle of a cyclic quadrilateral is 3 times least. The circular measure of the least angle is :

- (A) 60° (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{3}$ (D) None of these

ANS : B

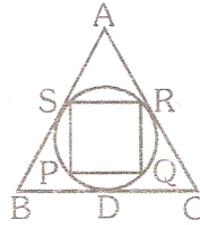
53. A circle is inscribed in an equilateral triangle of sides a , the area of any square inscribed in the circle is :

(A) $6a^2$

(B) $3a^2$

(C) $\frac{a^2}{6}$

(D) $\frac{a^2}{3}$



ANS : C

54. If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^8 x + \cos^6 x + 2\cos^4 x + \cos^2 x - 2$ is equal to :

(A) 0

(B) 1

(C) 2

(D) $\sin^2 x$

ANS : D

55. The angles of elevation of the top of a TV tower from three points A, B and C in a straight line (in the horizontal plane) through the foot of tower are α , 2α and 3α respectively. If $AB = a$, the height of tower is :

(A) $a \tan \alpha$

(B) $a \sin \alpha$

(C) $a \sin 2\alpha$

(D) $a \sin 3\alpha$

ANS : C

56. The expression $\operatorname{cosec}^2 A \cot^2 A - \sec^2 A \tan^2 A - (\cot^2 A - \tan^2 A) (\sec^2 A \operatorname{cosec}^2 A - 1)$ is equal to :

(A) 0

(B) 1

(C) -1

(D) None of these

ANS : A

57. $(1 + \tan \alpha \tan \beta)^2 + (\tan \alpha - \tan \beta)^2$ is equal to :

(A) $\cos^2 \alpha \cos^2 \beta$

(B) $\tan^2 \alpha \tan^2 \beta$

(C) $\tan^2 \alpha + \tan^2 \beta$

(D) $\sec^2 \alpha \sec^2 \beta$

ANS : D

58. From the top of a light house, 60 m high with its base at the sea level, the angle of depression of a boat is 15° . The distance of the boat from the foot of the light house is :

(A) $\left(\frac{\sqrt{3}+1}{\sqrt{3}-1}\right) 60$ m

(B) $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ m

(C) $\left(\frac{\sqrt{3}-1}{\sqrt{3}+1}\right) 60$ m

(D) None of these

ANS : A

59. The angles of elevation of the top of a tower as observed from the bottom and top of a building of height 60 m are 60° and 45° respectively. The distance of the base of the tower from the base of the building is :

(A) $30(\sqrt{3}-1)$ m (B) $30(3+\sqrt{3})$ m (C) $30(3-\sqrt{3})$ m (D) $30(\sqrt{3}+1)$ m

ANS : D

60. $\sin^6 \theta + \cos^6 \theta + 3\sin^2 \theta \cos^2 \theta$ is equal to :

(A) 0 (B) 1 (C) -1 (D) None of these

ANS : B

61. If $0 < x < \frac{\pi}{2}$, then the largest angle of a triangle whose sides are 1, $\sin x$, $\cos x$ is :

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{2} - x$ (D) x

ANS : A

62. ABC is right angled at C, then $\tan A + \tan B =$

(A) $\frac{a^2}{bc}$ (B) $\frac{c^2}{ab}$ (C) $\frac{b^2}{ac} - x$ (D) $a + b$

ANS : A

63. A rectangle with an area of 9 square metre is inscribed in a triangle ABC having $AB = 8$ m, $BC = 6$ m and $\angle ABC = 90^\circ$. The dimensions of the rectangle (in metres) are :

(A) $2, \frac{9}{2}$ or $6, \frac{3}{2}$ (B) 1, 9 or 3, 3 (C) 2, 4.5 (D) 4, 2.25

ANS : A

64. From the top of a light house, the angles of depression of two stations on opposite sides of it at distance 'a' apart are α and β . The height of the light house is :

(A) $\frac{a}{\cot \alpha \cot \beta}$ (B) $\frac{a}{\cot \alpha + \cot \beta}$ (C) $\frac{a \cot \alpha \cot \beta}{\cot \alpha + \cot \beta}$ (D) $\frac{a \tan \alpha \tan \beta}{\cot \alpha + \cot \beta}$

ANS : B

65. The value of the expression $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$ is equal to :
- (A) 0 (B) Not defined (C) 1 (D) ∞

ANS : C

66. If $\sin \theta_1 + \sin \theta_2 + \sin \theta_3 = 3$ then $\cos \theta_1 + \cos \theta_2 + \cos \theta_3$ is equal to :
- (A) 3 (B) 2 (C) 1 (D) 0

ANS : D

67. If $\sin x + \sin^2 x = 1$, then $\cos^8 x + 2\cos^6 x + \cos^4 x$ is equal to :
- (A) 0 (B) -1 (C) 2 (D) 1

ANS : D

68. Which of the following is not possible ?
- (A) $\sin \theta = \frac{5}{7}$ (B) $\cos \theta = \frac{1+t^2}{1-t^2}, t \neq 0$ (C) $\tan \theta = 100$ (D) $\sec \theta = \frac{5}{2}$

ANS : B

69. $\cot \theta = 2 \sin \theta \cos \theta (0 \leq \theta \leq 90^\circ)$ if θ equals :
- (A) 45° and 90° (B) 45° and 60° (C) 45° only (D) 90° only

ANS : A

70. In a triangle ABC right angled at C, $\tan A$ and $\tan B$ satisfy the equation :
- (A) $abx^2 - (a^2 + b^2)x - ab = 0$ (B) $abx^2 - c^2x + ab = 0$
- (C) $c^2x^2 - abx + c^2 = 0$ (D) $ax^2 - bx + a = 0$

ANS : B

71. The area of the circle and the area of a regular polygon of n sides and of perimeter equal to that of the circle are in the ratio of :
- (A) $\tan\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$ (B) $\cos\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$ (C) $\sin\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$ (D) $\cot\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$

ANS : A

72. If $\tan \theta + \sec \theta = \sqrt{3}$, $0 < \theta < \frac{\pi}{2}$, then θ is equal to :

- (A) $\frac{\pi}{3}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{4}$ (D) None of these

ANS : B

73. A tower subtends an angle α at a point 'A' in the plane of it's base and the angle of depression of the foot of the tower at a height b just above A is β . Then the height of the tower is :

- (A) $b \tan \alpha \cot \beta$ (B) $b \cot \alpha \tan \beta$ (C) $b \tan \alpha \tan \beta$ (D) $b \cot \alpha \cot \beta$

ANS : A

74. If $\sin x + \sin^2 x = 1$, then $\cos^2 x + \cos^4 x$ is equal to :

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

ANS : A

75. The angle of elevation of a tower from a point A due south of it is x and from a point b due to east of A is y . if

$AB = \ell$, the height h of the tower is :

- (A) $\frac{\ell}{\sqrt{\cot^2 y - \cot^2 x}}$ (B) $\frac{\ell}{\sqrt{\tan^2 y - \tan^2 x}}$ (C) $\ell \sqrt{\cot^2 y - \cot^2 x}$ (D) $\ell \sqrt{\tan^2 y - \tan^2 x}$

ANS : A

76. In ΔABC . $AB = 30$ cm and $\angle C = 45^\circ$. The length of the radius of circumcircle of ΔABC is :

- (A) $15\sqrt{2}$ cm (B) $5\sqrt{2}$ cm (C) $15\sqrt{3}$ cm (D) $5\sqrt{3}$ cm

ANS : A

77. The radius of the circumcircle of ΔABC is $\frac{2\sqrt{3}}{3}$ cm. If $BC = 2$ cm, the size of angle A is :

- (A) 30° (B) 60° (C) 90° (D) 45°

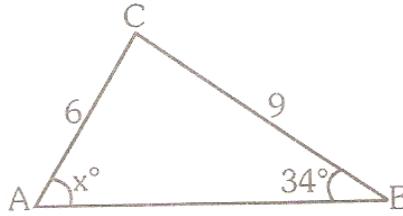
ANS : B

78. In ΔABC , $\angle A : \angle B = 1 : 3 : 8$. If $AB = 10$ cm, the length of AC is : [Use : $\sin(180^\circ - \theta) = \sin \theta$]

- (A) $\frac{10\sqrt{6}}{3}$ cm (B) $\frac{10\sqrt{3}}{3}$ cm (C) $\frac{10\sqrt{3}}{6}$ cm (D) None of these

ANS : A

79. The measure of angle x in the triangle below is :



(A) 54°

(B) 57.01°

(C) 59°

(D) None of these

ANS : B

80. In a circle of radius 7 cm, the arc AB subtends an angle of 120° at the centre. The length of chord AB is :

(A) $7\sqrt{3}$ cm

(B) $3\sqrt{2}$ cm

(C) $5\sqrt{3}$ cm

(D) $2\sqrt{3}$ cm

ANS : A

81. In a triangle ABC, $a = 6$, $b = 12$ and $B = 60^\circ$. The value of $\sin A$ is ;

(A) $\frac{\sqrt{3}}{4}$ cm

(B) $\frac{1}{\sqrt{3}}$ cm

(C) $\frac{1}{2}$ cm

(D) None of these

ANS : A

82. In $\triangle ABC$, $a = 2$, $b = 3$ and $\sin A = \frac{2}{3}$, then $\angle B$ is equal to :

(A) 30°

(B) 60°

(C) 90°

(D) 120°

ANS : C

83. In $\triangle ABC$, $a = 4$, $c = 12$ and $\angle C = 60^\circ$, then the value of $\sin A$ is :

(A) $\frac{1}{2\sqrt{3}}$ cm

(B) $\frac{-1}{2\sqrt{3}}$ cm

(C) $\frac{\sqrt{2}}{3}$ cm

(D) $\frac{\sqrt{3}}{2}$

ANS : A

84. In an isosceles triangle ABC, the base $AB = 12$ cm and the angle at the top is 30° . D is a point on the side BC such that $\angle CAD : \angle DAB = 1 : 4$. The length of the radius of circumcircle of $\triangle ABC$ is

(A) $3\sqrt{2}$ cm

(B) $5\sqrt{2}$ cm

(C) $6\sqrt{2}$ cm

(D) $10\sqrt{2}$ cm

ANS : C

85. The base of an isosceles triangle is 10 cm, and the angle at the base is $2a$. The length of the angle bisector of one of the base angles is : [Use : $\sin(180^\circ - \theta) = \sin \theta$]

- (A) $10 \sin 2a \cos 2a$ (B) $\frac{10 \sin 2a}{\sin 3a}$ (C) $\frac{10 \sin 3a}{\sin 2a}$ (D) $10 \sin 4a$

ANS : B

86. In the circumference with radius 50 cm is inscribed a quadrilateral. Two of its angles are 45° and 120° . The length of diagonals is :

- (A) $25\sqrt{2}$ cm; $25\sqrt{3}$ cm (B) $10\sqrt{2}$ cm; $10\sqrt{3}$ cm
(C) $50\sqrt{2}$ cm; $50\sqrt{3}$ cm (D) None of these

ANS : C

87. In $\triangle ABC$, $\angle A = 45^\circ$, $\angle B = 30^\circ$. M is a point on the side AB. The radius of the circumcircle of $\triangle AMC$ is R. The radius of the circumcircle of $\triangle MBC$ is :

- (A) $2R$ cm (B) $R\sqrt{2}$ cm (C) $\frac{R}{\sqrt{2}}$ cm (D) None of these

ANS : B

88. The angles of a triangle are as $5 : 5 : 2$, the ratio of the greatest side to the least side is :

- (A) $2 + \sqrt{3} : 1$ (B) $2 + \sqrt{3} : 2 - \sqrt{3}$ (C) $\sqrt{3} - 1 : \sqrt{3} + 1$ (D) None of these

ANS : A

89. The perimeter of an acute angled triangle ABC is 6 times the arithmetic mean of the sines of its angles. If the side b is 2, the angle B is :

- (A) 30° (B) 60° (C) 90° (D) None of these

ANS : C

90. If the angles of a triangle be in the ratio $1 : 4 : 5$, then the ratio of its greatest side to the smallest side is :

- (A) $5 : 1$ (B) $(\sqrt{5} + 1) : 1$ (C) $1 : (\sqrt{5} - 1)$ (D) None of these

ANS : B

91. In a $\triangle ABC$, if $a \sin A = b \sin B$, then the triangle is :

- (A) Right angled (B) Equilateral (C) Right angled isosceles (D) Isosceles

ANS : D

92. Points D, E are taken on the side BC of a triangle ABC such that $BD = DE = EC$. If $\angle BAD = x$, $\angle DAE = y$, $\angle EAC = z$, then the value of $\frac{\sin(x+y)\sin(y+z)}{\sin x \sin z}$ is equal to :

- (A) 1 (B) 2 (C) 4b (D) None of these

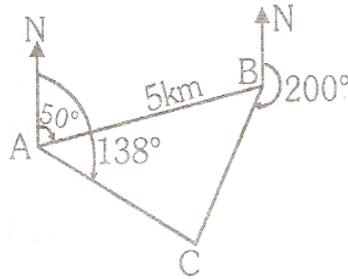
ANS : A

93. In a triangle ABC, $A = 45^\circ$, $B = 75^\circ$, then $a + \sqrt{2}c$ is equal to :

- (A) 2b (B) b (C) 4b (D) $\frac{b}{2}$

ANS : A

94. A hiker starts her journey at point A. She notices a farm house at point C and works out its bearing is at 138° . She then walks for 5 kilometres and stops at point B. At point B the hiker looks again at the farm house and calculates its bearing now to be 200° . The distance AC and BC respectively are :



- (A) 3.28 km, 6.55 km (B) 2.66 km, 5.83 km
(C) 2.83 km, 5.66 km (D) None of these

ANS : C

95. The angles of a triangle are in the ratio $4 : 1 : 1$, then the ratio of the largest side to the perimeter is (Use : $\sin(180^\circ - \theta) = \sin \theta$)

- (A) $1 : (1 + \sqrt{3})$ (B) $2 : 3$ (C) $\sqrt{3} : (2 + \sqrt{3})$ (D) $1 : (2 + \sqrt{3})$

ANS : C

96. In $\triangle ABC$, $AB = 5$ cm, $AC = 6$ cm, $\angle A = 60^\circ$. The length of the side BC is :

- (A) $\sqrt{31}$ cm (B) $\sqrt{29}$ cm (C) 31 cm (D) 29 cm

ANS : A

97. Which of the following options contains the sides of a right angled triangle ?

- (A) 13, 14, 15 (B) 12, 35, 37 (C) 13, 15, 24 (D) None of these

ANS : B

98. The size of $\angle C$ of $\triangle ABC$, if $a = 2\sqrt{3}$ cm, $b = 3$ cm, $c = \sqrt{3}$ cm is :

- (A) 90° (B) 60° (C) 30° (D) None of these

ANS : C

99. The size of $\angle C$ of $\triangle ABC$, if $a = 11$ cm, $b = 60$ cm, $c = 61$ cm is :

- (A) 90° (B) 60° (C) 30° (D) None of these

ANS : A

100. In $\triangle ABC$ we have $AC = 3$ cm, $BC = \sqrt{5}$ cm, $\angle A = 45^\circ$. The length of the side AB is :

- (A) $\sqrt{3}$ cm (B) $3\sqrt{3}$ cm (C) $\sqrt{2}$ cm or $2\sqrt{2}$ cm (D) $\sqrt{3}$ cm or $3\sqrt{3}$ cm

ANS : C