Unit 1 : Arithmetic Progressions

1. If the nth term of an Arithmetic Progression is $a_n = 4n + 5$ then the third term is _____

    a) 5   b) 9   c) 13   d) 17

2. The value of 'x' in the Arithmetic Progression 2, x, 14 is _____

    a) 28   b) 16   c) 7   d) 8

3. In an Arithmetic Progression where $a_n = 3n - 2$, the 2nd term is _____

    a) 2   b) 4   c) 6   d) 8

4. The fourth term of an Arithmetic Progression where $a_n = 2n - 1$ is _____

    a) 23   b) 9   c)5   d) 7

5. The common difference of the Arithmetic Progression 3, 6, 9, 12 …….. is _____

    a) -3   b) 3   c) 6   d)9

6. The sum of the first 'n' Natural Numbers is _____

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

7. Which among the following is an Arithmetic Progression?

    a) 1, 4, 6 . . . .   b)12, 10, 14. . . . .   c)35, 30, 25 . . . . .   d)8, 13, 19, ...

8. The formula to find the nth term of an Arithmetic Progression is _____

    a) $a_n = a - (n - 1)d$ b) $a_n = a + (n +1)d$ c) $a_n = a + (n - 1)d$ d) $a_n = 2a + (n - 1)d$

9. If in an Arithmetic Progression $a_n = 3n - 1$ then the common difference is _____

    a) 1   b) 2   c) 3   d) 4

10. Sum of first 10 Natural Numbers is _____

    a) 45   b)50   c)55   d)65

11. The common difference of the Arithmetic Progression 3, 1, -1, -3 …. is _____

    a) 2   b) -2   c) 4   d) -4

12. The common difference of the Arithmetic Progression $\frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}$ . . . . . . is _____

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

13. The number to be entered into the ☐   in the Arithmetic Progression 2, ☐   , 26 is

    a)12   b)13   c)14   d) 16

14. If the first term is 'a' and the nth term is 'l' then the sum of n terms of an Arithmetic Progression is _____

    a) $S_n = \frac{a}{2}(n + l)$ b) $S_n = \frac{n}{2}(a + l)$ c) $S_n = \frac{l}{2}(a + n)$ d) $S_n = \frac{1}{2}a(n + l)$

15. If the first term is 'a' and the common difference is 'd' then the formula to calculate the sum of n terms of an Arithmetic Progression is _____

   a) $S_n = \frac{n}{2}(a + (n-1)d)$ b) $S_n = \frac{n}{2}(a + 2(n-1)d)$

   c) $S_n = \frac{n}{2}(2a + (n-1)d)$ d) $S_n = \frac{n}{2}(n+1)d)$

16. The next four terms of the Arithmetic Progression 2, 5, 8, 11, 14 ……….. is _____

   a) 16, 18, 20, 22   b) 15, 16, 17, 18   c) 18, 22, 24, 26   d) 17, 20, 23, 26

17. The third term of an Arithmetic Progression whose fourth term is 9 and common difference is 2 is

   _____

   a) 8   b) 7   c) 6   d) 5

18. If the nth term of an Arithmetic Progression is $a_n = 13 - 2n$ then its fourth term is _____

   a) 9   b) 7   c) 5   d) 4

19. In an Arithmetic Progression of $a_3 = 10$ and $a_4 = 8$ then the common difference is _____

   a) -2   b) 2   c)1   d)-1

20. The next terms of the Arithmetic Progression 4, -1, -6 ……. is _____

   a) -10 , -15   b) -12, -15   c)11, 16   d)-11, -16

21. The value of S_3 in the Arithmetic Progression 7, 4, 1, -2. . . . . .

   a) 1   b)3   c) -3   d)12

22. If the sum of an Arithmetic Progression whose first term and the last term are 1 and 11 respectively is 36 then the number of its terms is _____

   a)5   b)6   c)7   d)8

23. If the nth term of an Arithmetic Progression is $a_n = 2n - 1$ then the Arithmetic Progression is ____

   a)1, 5, 9 ……   b)2, 6, 10 ……   c)1, 3, 5……   d)1, 2, 3……

24. The common difference of an Arithmetic Progression whose n^{th} term is $a_n = 5 - 2n$ is _____

   a) -3   b) -2   c) -1   d) 2

25. In the Arithmetic Progression 6, x, y, 18 the value of x and y respectively are _____

   a) 8, 12   b) 10, 13   c) 10, 14   d) 14, 10

26. The common difference of two Arithmetic Progressions is equal. If the first term of the first Arithmetic Progression is 6 and the first term of the second Arithmetic Progression is 10 then the difference of the 5th term of these Arithmetic Progressions is _____

   a) 2   b) 3   c) 4   d) 5

27. If the sum of 'n' terms of an Arithmetic Progression is $S_n = 3n^2 + 5n$ then its 2nd term is _____

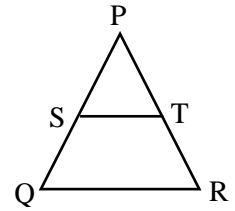   a) 22   b) 14   c) 12   d) 10

Unit 2: Triangles

28. The mathematician who proposed that " A line drawn parallel to one side of the triangle divides the othe two sides in equal proportion" is _____

    a) Pythagoras   b) Thales   c) Euclid   d) Euler

29. In the given figure if ST‖QR then $\frac{PS}{SQ}$ is equal to _____

    a) $\frac{PT}{TR}$ b) $\frac{PS}{TR}$ c) $\frac{PT}{SQ}$ d) $\frac{PT}{SR}$
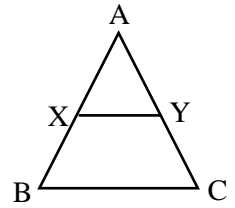

30. If the ratios of the sides of two similar triangles is 4 : 9 then the ratios of the areas of these triangles is _____

    a) 2 : 3   b) 4 : 9   c) 81 : 16   d) 16 : 81

31. In the given figure if XY‖BC then $\frac{AX}{AB}$ is equal to _____

    a) $\frac{AX}{AY}$ b) $\frac{AX}{XB}$ c) $\frac{AY}{AC}$ d) $\frac{AC}{AY}$

32. The length of the sides of a triangle are given below. Which of the following forms a right-angled triangle?

    a) 7 cm, 24 cm, 25cm   b) 3 cm, 8 cm, 6 cm

    b) 50 cm, 80 cm, 100 cm   d) 130 cm, 12 cm, 5 cm

33. ΔABC and ΔBDE are two similar triangles. If 'D' is the midpoint of BC then Area of ΔABC : Areas of ΔBDE is equal to _____

    a) 2 : 1   b) 1 : 2   c) 4 : 1   d) 1 : 4
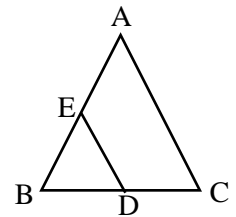
34. The mathematician who proposed the theorem which states that "In a right-angled triangle, the square o the hypotenuse is equal to the sum of the squares on the other two sides" is _____

    a) Thales   b) Pythagoras   c) Brahma Gupta   d) Euclid

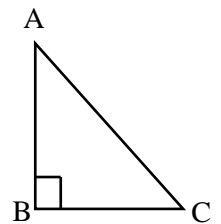35. The corresponding sides of two similar triangles are _____

    a) Equal   b) Parallel   c) Not Equal   d) Proportional

36. The areas of two similar triangles are 120 cm² and 480 cm² respectively, then the ratio of any pair of it corresponding sides is _____

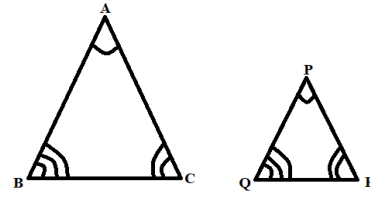   a) 1 : 4   b) 1 : 2   c) 4 : 1   d) 2 : 3

37. In the given figure if $\angle B = 90^0$ then the correct relation among the following is _____

    a) $BC^2 + AC^2 = AB^2$ b) $AB^2 + AC^2 = BC^2$

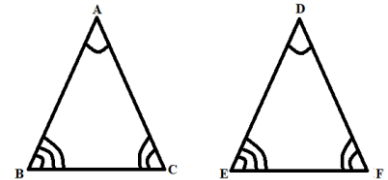   c) $AB^2 - AC^2 = BC^2$ d) $AC^2 - BC^2 = AB^2$

38. In the figure if two triangles are similar then the ratio of their

corresponding sides is _____

a) $\dfrac{AB}{PQ} = \dfrac{BC}{PR} = \dfrac{AC}{QR}$ b) $\dfrac{AB}{PR} = \dfrac{BC}{QR} = \dfrac{AC}{PQ}$

c) $\dfrac{AB}{QR} = \dfrac{BC}{RP} = \dfrac{AC}{PQ}$ d) $\dfrac{AB}{PQ} = \dfrac{BC}{QR} = \dfrac{AC}{PR}$

39. In the given figure $\Delta ABC \sim \Delta DEF$ then $\dfrac{Area\ of\ \Delta ABC}{Area\ of\ \Delta DEF}$ is equal to

_____

a) $\dfrac{AB^2}{EF^2}$ b) $\dfrac{AC^2}{EF^2}$ c) $\dfrac{BC^2}{EF^2}$ d) $\dfrac{AB^2}{DF^2}$
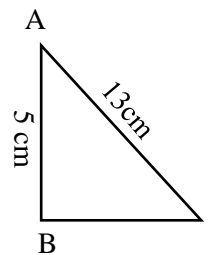
40. The ratios of the areas of two similar triangles is 9 : 16 then the ratios of their

corresponding sides is _____

a) 3 : 4   b) 4 : 3   c) 9 : 16   d) 81 : 256

41. In ΔABC if $\angle B = 90^0$, AC = 13 cm and AB = 5 cm then BC is equal to _____
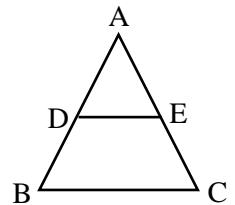
a) 10 cm   b) 11 cm   c) 12 cm   d) 18 cm

42. In ΔABC if area of $\Delta ABC = 54$ cm, BC = 3 cm, EF = 4 cm then area of ΔDEF is _____

a) 90 cm^2 b) 96cm^2 c) 94 cm^2 d)92 cm^2

43. In ΔABC if DE‖BC AD = 2 cm, DB = 3 cm and AE = 3 cm then EC is equal to _____

a) 3.5 cm   b) 4.5 cm   d)) 4.6 cm   d) 5.4 cm

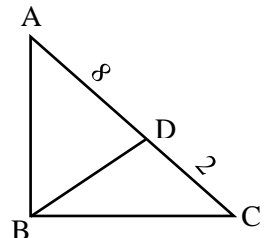44. In ΔABC if AB = 6 cm , BC = 8cm, AC = 10 cm then value of $\angle B$ is _____

a) 120^0 b) 90^0 c) 60^0 d) 30^0

45. In ΔABC $\angle B = 90^0$ if AD = 8 cm, CD = 2 cm then BD is _____

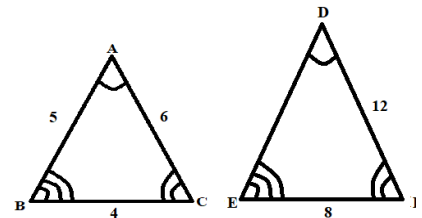a) 4 cm   b) 8 cm   c) 10 cm   d) 16 cm

46. A 6m tall pole casts a shadow of length 4m on the ground. At the same time if

a building standing next to it, casts a shadow of length 28m then the height of the building is _____
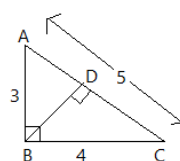
a) 48m   b) 42m   c) 40m   d) 36m

47. In the figure if $\Delta ABC \sim \Delta DEF$ then length of DE is _____
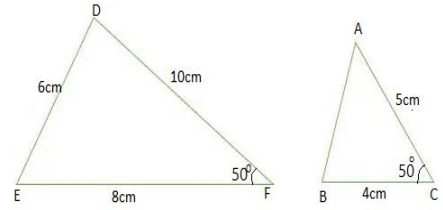
a) 15 cm   b) 12 cm   c) 10 cm   d) 8 cm

48. In triangle ABC if $\angle B = 90^0$, then AD =
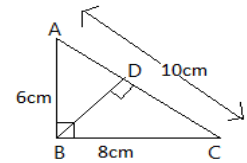
a) 4cm   b) 3.2cm   c) 2.8cm   d) 1.8cm

49. In the figure $\Delta DEF \sim \Delta ABC$ and $\angle F = \angle C = 50^0$ then length of

AB is _____

a) 8cm   b) 6cm   c) 4cm   d) 3cm

50. In triangle ABC if $\angle B = 90^0$, then CD = _____
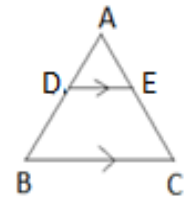
a) 6.4cm   b) 6.2cm   c) 5.4cm   d) 5.2cm

51. In triangle ABC if DE || BC and AD:DB = 3:4 then

Area of ΔABC : Area of ΔDEF = _____

a) 9:49   b) 49:9   c) 1:49   d) 49:1

Unit 3: Pair of Linear Equations in Two Variables

52. If a pair of linear equations $x + 2y = 3$ and $2x + 4y = k$ are coincident then the value of 'k' is _____

    a) 3   b) 6   c) -3   d) -6

53. If $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are pair of linear equations which form intersecting lines the the ratio of their co-efficient is _____

    a) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ b) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ c) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ d) $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

54. Number of solutions for the pair of Linear Equations $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ is _____

    a) 0   b) 1   c) 2   d) Infinity

55. In the equation $x + y = 7$ if $x = 3$ then the value of y is _____

    a) 6   b) 5   c) 4   d) 3

56. If the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are coincident then the correct relatio among the following is _____

    a) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ b) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ c) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ d) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

57. If $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are pair of linear equations which have infinite solutions, the the correct relation among the following is _____

    a) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ b) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ c) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ d) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

58. For what value of k will the graphs of the linear equations $2x - y + 4 = 0$ and $6x - ky + 12 = 0$ coincide?

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

59. If the graphical representation of pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ i coincident then they have _____

    a) No solution   b) Unique Solution   c) Two solutions   d) Infinitely many solutions

60. If the graphical representation of the pair of linear equations $4x + ky + 8 = 0$ and $4x + 4y + 2 = 0$ ar parallel then the value of k is _____

    a) -4   b) 2   c) 4   d) 8

61. Types of lines represented by the pair of linear equations $6x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$ is _____

    a) Intersecting   b) Perpendicular   c) Parallel   d) Coincident

62. On solving the equation x + y = 4 and x - y = 2 the values of x and y will be _____

a) (3, 1) b) (2, 2) c) (1, 3) d) (10, 4)

63. In the given equations 2x + y = 5 and x − y = 1 the values of x and y will be _____

a) (3,2) b) (2, 1) c) (1, 2) d) (2, 3)

64. In the equation 2x + y = 8 if x = 3 then the value of y is _____

a) 4 b) 3 c) 2 d) 1

65. If the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are consistent then the number o

solutions is _____

a) 0 b) 1 c) 2 d) Infinite

66. The value of $\frac{c_1}{c_2}$ in the pair of linear equations 3x + 2y = 5 and 2x − y − 6 = 0 is _____

a) $\frac{-5}{6}$ b) $\frac{-6}{5}$ c) $\frac{5}{6}$ d) $\frac{3}{2}$

67. If x + 2y − 3 = 0 and 5x + ky + 7 = 0 are a pair of linear equations which have no solution then the valu

of k is _____

a) 10 b) 6 c) 3 d)1

68. If the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are consistent then their graphica

representation is _____

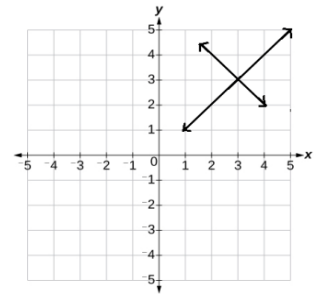a) Parallel b) Coincident c) Intersecting d) Intersecting or Coincident

69. Number of solutions for the pair of linear equations x + y = 0 and x + y = 3 is _____

a) One solution b) Two solutions c) No solutions d) Infinite Solutions

70. In the equation 3x + y = 10 if y = 4 then the value of x is _____

71. 0 b) 1 c) 2 d) 3

72. In the given graphical representation, the solution to the pair of linear equations is _____
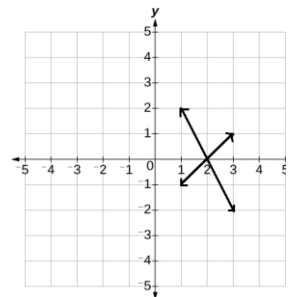
a) (3,3)   b) (2,3)   c) (3,2)   d) (4,4)

73. If y = 5 in the linear equation y = 2x -3 then the value of x is _____

a) 2   b) 3   c) 4   d) 5

74. The solution to the pair of linear equations 2x – y = 2 and x -y = 0 is

a) (4,4)   b) (3,3)   c) (2,2)   d) (1,1)

75. The solution for the given pair of linear equations from the graph is _____

a) (0,2)   b) (2,0)   c) (0,0)   d) (2,2)

76. If the line formed by the linear equation 2x – y = 5 passes through the point (3,

a) then the value of 'a' is _____

a) 0   b) 1   c) 2   d) -1

77. The solution to the pair of linear equations x + y = 3 and x + y = -7 is _____

a) One Solution   b) Two Solutions   c) Infinite Solutions   d) No Solutions

78. If the graphical representation of the equations x + 4y = 5 and 3x + 2ky + 15 = 0 are parallel then the value of 'k' is _____

a) 3   b) 4   c) 6   d) 12

79. The value of x and y which satisfies the equation 4x – 3y = 5 is _____

a) x=1, y=-1   b) x=2, y=1   c) x=3, y=2   d) x=2, y=-2

80. The number of solutions for the pair of linear equations 3x + 4y = 5 and 9x + 12y = 15 is _____

(a) Two Solutions   (b) One Solution

(c) Infinitely many Solutions   (d) No Solutions

Unit 4: Circles

81. A straight line which intersects a circle at two points is called _____

    a) Secant   b) Tangent   c) Radius   d) Perpendicular Line

82. The number of points in which a tangent touches a circle are _____

    a) 0   b) 1   c) 2   d) Infinite

83. The number of tangents that a circle can have is _____

    a) 1   b) 2   c) 3   d) Infinite

84. The maximum number of parallel tangents that a circle can have are ____

    a) 1   b) 2   c) 4   d) Infinite

85. The common point between the circle and the tangent of a circle is _____

    a) Centre   b) Point of Contact   c) External Point   d) None of these

86. The length of the tangent drawn to a circle of radius 3 cm from a distance 5 cm from its centre is

    _____

    a) 3 cm   b) 4 cm   c) 5 cm   d) 6 cm

87. If the length of the tangent drawn from an external point Q to a circle is 24 cm and the distance between the point Q and centre of the circle is 25 cm then the measure of the radius is _____

    a) 7 cm   b) 12 cm   c) 15 cm   d) 24.5 cm

88. In the figure $\angle POQ = 110^0$. If TP and TQ are the tangents to the circle with 'O', then the measure of $\angle PTQ$ is _____

    a) 60^0 b) 70^0 c) 80^0 d) 90^0

89. If the angle between the tangents PA and PB drawn from an external point 'P' to a circle with centre 'O' is 80^0 then measure of $\angle POA$ is _____

    a) 40^0 b) 50^0 c) 80^0 d) 100^0

90. If the length of the tangent drawn from an external point 'A', 5 cm away from the centre of the circle is cm, then the length of the radius is _____

    a) 5 cm   b) 4.5 cm   c) 4 cm   d) 3 cm

91. In the figure 'O' is the centre of the circle. If $\angle AOB = 100^0$ then $\angle OAB$ is   equal to _____

    a) 80^0 b) 50^0 c) 40^0 d) 30^0

92. The angle between the tangent and the radius drawn at the point of contact is _____

    a) 45^0 b) 60^0 c) 80^0 d) 90^0

93. The maximum number of tangents that can be drawn to a circle from an external point is _____

    a) 0   b) 1   c) 2   d) Infinite
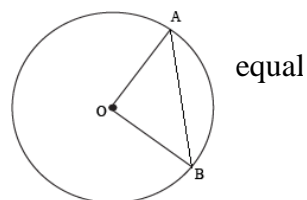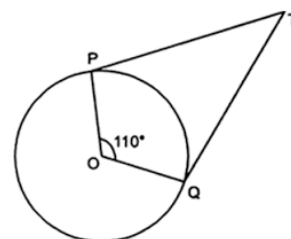
94. In the figure if PA and PB are tangent to the circle with centre 'O' then $\angle AOB$
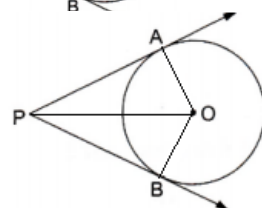
$\angle APB = $ _____

a) 90^0 b) 120^0 c) 180^0 d) 360^0
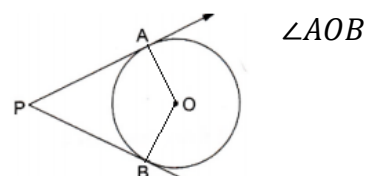
95. In the figure 'O' is the centre of the circle, PA and PB are tangents.

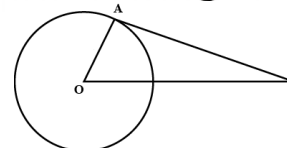If $\angle AOB = 100^0$ then measure of $\angle APO$ is _____

a) 90^0 b) 80^0 c) 50^0 d) 40^0

96. In the figure 'O' is the centre of the circle, PA is the tangent. If $\angle APO = 50^0$

then $\angle APO = $ _____

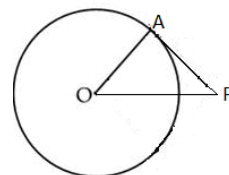a) 60^0 b) 50^0 c) 40^0 d) 30^0

97. The maximum number of tangents that can be drawn to circle at a point on it is
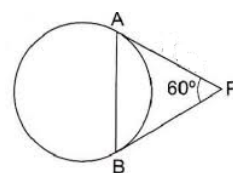
_____

a) 0   b) 1   c) 2   d) Infinite

98. In the figure 'O' is the centre of the circle. If OA = PA then $\angle AOP = $

_____
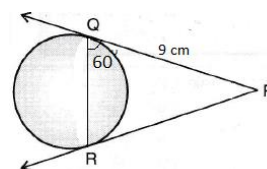
a) 50^0 b) 45^0 c) 40^0 d) 30^0

99. In the figure PA and PB are tangents to the circle. If $\angle APB = 60^0$ then ΔAPB is

_____.

a) Isosceles Triangles   b) Equilateral Triangle
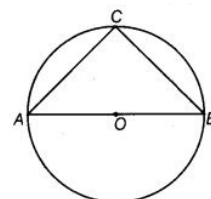
c) Scalene Triangle   d) Right Angled Triangle

100. In the figure PQ and PR are the tangents. If $\angle PQR = 60^0$ and PQ = 9 cm then

the length of the chord QR is _____

a) 6 cm   b) 7 cm   c) 8 cm   d) 9 cm

101. The tangents drawn at the end points of the diameter of a circle _____

a) Intersect each other   b) Coincide with each other

c) Parallel to each other   d) Perpendicular to each other

102. In the figure 'O' is centre of the circle. Measure of $\angle ACB$ is _____

a) 45^0 b) 60^0 c) 90^0 d) 100^0

103. In the figure PQ and PR are the tangents. If $\angle QPR = 70^0$ then $\angle PQR = $ _____

a) 70^0 b) 65^0 c) 55^0 d) 50^0
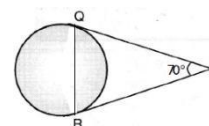
104. In the figure AB, AD and DE are the tangents to the circle. If AB = 3 cm and

DE = 4 cm then the length of AD is _____

b) 8 cm   b) 7 cm   c) 6 cm   d) 5 cm
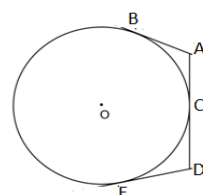
105. In the figure TQ and TF are the tangents to the bigger circle and TR and TF are the tangents to the smaller circle. If TQ = 8 cm the TR = _____

a) 10 cm   b) 9 cm   c) 8 cm   d) 6 cm
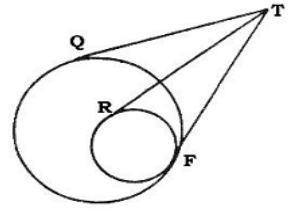
106. In the figure if 'O' is the centre of the circle then the longest chord is

_____

a) AB   b) CD   c) PQ   d) RS

Unit 5: Constructions

106. In the figure the ratio in which the point 'P' divides the line segment AB is _____

    a) 3 : 2   b) 2 : 3   c) 2 : 1   d) 3 : 1

107. If a point 'P' divides a line segment AB such that $\frac{PB}{AB} = \frac{3}{7}$ then the ratio of AP : PB will be _____

    a) 4 : 7   b) 7 : 4   c) 7 : 3   d) 4 : 3

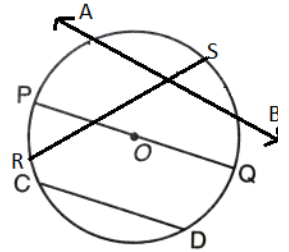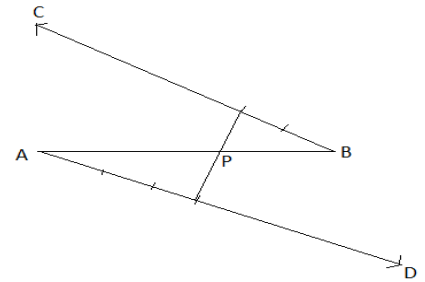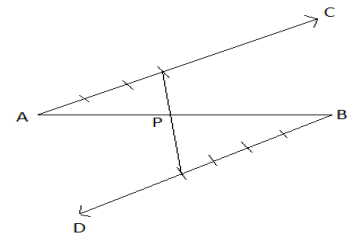108. To construct a triangle similar to ΔABC, given BC = 4.5 cm, $\angle B = 45^0$, $\angle C = 60^0$ and the ratio of the corresponding sides is $\frac{3}{7}$ then the given line segment BC should be divided in the ratio _____

    a) 3 : 4   b) 3 : 7   c) 3 : 10   d) 4 : 7

109. In the figure the ratio in which the point 'P' divides the line segment AB is _____

    a) 3 : 2   b) 3: 4   c) 4 : 3   d) 2 : 3

110. In order to divide a given line segment in the ratio 3 : 5, the number of arcs to be constructed on the line forming an acute angle with the given line segment is _____.

    a) 3   b) 5   c) 8   d) 10

111. In the given figure to construct ΔABC similar to ΔADE , the ratio of the corresponding sides will be _____

    a) $\frac{7}{3}$ b) $\frac{3}{4}$ c) $\frac{4}{3}$ d) $\frac{3}{7}$

112. If two tangents with angles between them to be 60^0 are to be constructed from an external point, then the angle between the radii should be _____

    a) 60^0 b) 75^0 c) 90^0 d) 120^0

113. In the given figure the ratio in which the point 'P' divides the line segment AB is _____

    a) 4 : 3   b) 3 : 4   c) 4 : 7   d) 7 : 4

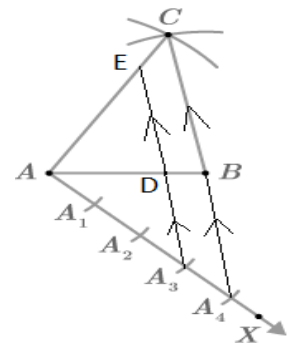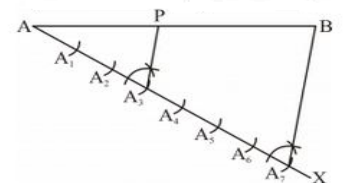114. To construct tangents to a circle from an external point such that the angle between the tangents is 100^0 then the angle between the radii should be _____

    a) 100^0 b) 90^0 c) 80^0 d) 50^0

115. Number of tangents that can be drawn to a circle from its non-centric end of a radii is _____

   a) 1   b) 2   c) 3   d) Infinite

116. On constructing $\Delta ABC \sim \Delta ADE$ the ratio of the corresponding sides of ΔADE are $\frac{3}{5}$ times the corresponding sides of ΔABC. If AB=5cm, AC = 6cm and BC = 7cm then the length of sides BD and DE of ΔADE (By Calculations)

   a) 2cm, 3cm   b) 3cm, 3.6cm

   c) 3cm, 4.6cm   d) 4cm, 3.6cm
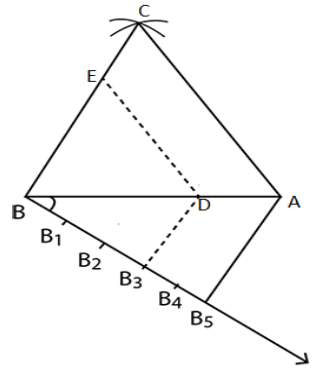
117. Number of tangents that can be drawn to a circle from a point inside it is _____

   a) 2   b) 1   c) 0   d) Infinite

118. ΔABC is constructed similar to ΔBDE. In ΔABC $\angle B = 90^0$, AB=3cm and BC=4cm. If the corresponding sides of ΔBDE is $\frac{5}{2}$ times that of ΔABC then the length of BD and BE respectively are _____ (By Calculations)

   a) 10cm, 7.5cm   b) 7.5cm, 10cm

   c) 8cm, 12cm   d) 12cm, 8cm
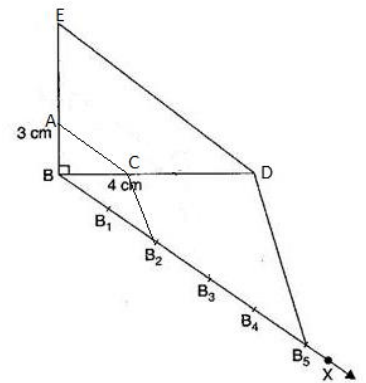
Unit 6: Coordinate Geometry

119. The distance of the point P(4,3) from the x – axis is _____

    a) 2 units b) 3 units   c) 4 units   d) 5 units

120. In the given graph the coordinates of the point A is _____

    a) (-1, 0) b) (1, -1)   c) (0, 2)   d) (2, 0)
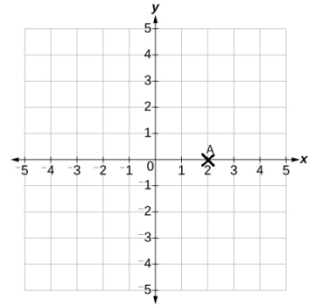
121. The coordinates of the midpoint which divides the line joining A (x_1, y_1)

    and B (x_2, y_2) is _____

    a) $(\frac{x_1+y_1}{2}, \frac{x_2+y_2}{2})$ b) $(\frac{x_2-x_1}{2}, \frac{y_2-y_1}{2})$

    b) $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$ d) $(\frac{x_1-x_2}{2}, \frac{y_1-y_2}{2})$

122. In the given figure if D is the midpoint of BC, then the coordinates of D are

    _____

    a) $(\frac{x_2+x_3}{2}, \frac{y_2+y_3}{2})$ b) $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$

    c) $(\frac{x_1+x_3}{2}, \frac{y_1+y_3}{2})$ d) $(\frac{x_2+y_3}{2}, \frac{y_2+x_3}{2})$
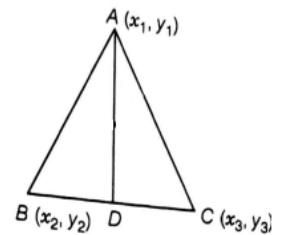
123. The distance of the point P(5,2) from the y – axis is _____

    a) 2 units   b) 4 units   c) 5 units   d) 7 units

124. The co-ordinates of the origin are _____

   a) (0,0)   b) (0,1)   c) (1,0)   d) (1,1)

125. The formula to find out the distance between the points (x_1, y_1) and (x_2, y_2)

    a) $\sqrt{(x_1 + x_2)^2 + (y_1 + y_2)^2}$ b) $\sqrt{(x_1 + x_2)^2 - (y_1 + y_2)^2}$

    c) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ d) $\sqrt{(x_2 - x_1)^2 - (y_2 - y_1)^2}$

126. The distance between the origin and the point (x, y) is _____

    a) $\sqrt{x^2 + y^2}$ b) $\sqrt{x^2 - y^2}$ c) $\sqrt{(x + y)^2}$ d) $\sqrt{(x - y)^2}$

127. The formula to find out the area of the triangle whose vertices are A (x_1, y_1), B (x_2, y_2) and   C

    (x_3, y_3) is _____

    a) $\frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$

    b) $\frac{1}{2}|x_1(y_2 - y_3) - x_2(y_3 - y_1) - x_3(y_1 - y_2)|$

    c) $\frac{1}{2}|x_1(y_2 + y_3) + x_2(y_3 + y_1) + x_3(y_1 + y_2)|$

    d) $\frac{1}{2}|x_1(y_2 + y_3) - x_2(y_3 + y_1) - x_3(y_1 + y_2)|$

128. The distance between the origin and the point (3, 4) is _____

   a) 3 units   b) 4 units   c) 5 units   d) 6 units

129. The co-ordinates of the midpoint of the line joining the points A (1, 4) and B (3, 6) is _____

   a) (5,2)   b) (2,5)   c) (4,10)   d) (10, 4)

130. The distance between the origin and the point (p, q) is _____

   a) $\sqrt{p^2 X\, q^2}$ b) $\sqrt{p^2 - q^2}$ c) $\sqrt{(p + q)^2}$ d) $\sqrt{p^2 + q^2}$

131. The distance between the origin and the point (4, -3) is _____

   a) 5 units   b) 4 units   c) 3 units   d) 1 unit

132. The distance between the origin and the point (12, 5) is _____

   a) 13 units   b) 12 units   c) 7 units   d) 5 units

133. The distance of the point P (5,3) from x axis and y axis is _____

   a)   5 units, 3 units   b) 3 units, 5 units

   c)   4 units, 3 units   d) 5 units, 2 units

134. The distance between the origin and the point (0,4) is _____

   a)   2 unitsb) 4 units   c) 8 units   d) 16 units

135. The distance of the point (-4, -7) from the y axis is _____

   a)   4 unitsb) 7 units   c)11 units   d)$\sqrt{65}$ units

136. The distance between the points (2,3) and (6,6) is _____

   a)   7 units b) 5 units   c) 4 units   d) 3 units

137. The coordinates of the point on the x axis will be in the form _____

   a)   (0, y)   b) (x,0)   c) (0,0)   d) (x,y)

138. The co-ordinates of the point of intersection of the x-axis and y-axis is _____

   a)   (1,0)   b) (0,1)   c) (0,0)   d) (1,1)

139. Ordinate of all points on the x-axis is _____

   a)   0   b) 1   c) 2   d) 3

140. Abscissa of all points on the y-axis is _____

   a)   3   b) 2   c) 1   d) 0

141. The coordinates of the points which divides the line segment joining the points (x_1, y_1) and (x_2, y_2) internally in the ratio $m_1 : m_2$ is _____

   a) $\left(\frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2}\right)$ b) $\left(\frac{m_1 x_2 - m_2 x_1}{m_1 - m_2}, \frac{m_1 y_2 - m_2 y_1}{m_1 - m_2}\right)$

   c) $\left(\frac{m_1 x_2 + m_2 x_1}{m_1 - m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 - m_2}\right)$ d) $\left(\frac{m_1 x_2 - m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 - m_2 y_1}{m_1 + m_2}\right)$

142. Which of the following point is on the x-axis?

   a)   (2,0)   b) (0,2)   c) (2,3)   d) (0, -2)

143. Which of the following point is on the y-axis?

    a)   (3,0)   b) (0, -4)   c) (-2,0)   d) (4,6)

144. If the midpoint of the line joining the coordinates A (5 , -2) and B(a , b) is the origin then the value of

    'a' and 'b' is _____

    a) (5,-2)   b) (-5,2)   c) (0,0)   d) (5,5)

145. If A (2,3) , B (4, k) and C(6,-3) are collinear then the value of 'k' is _____
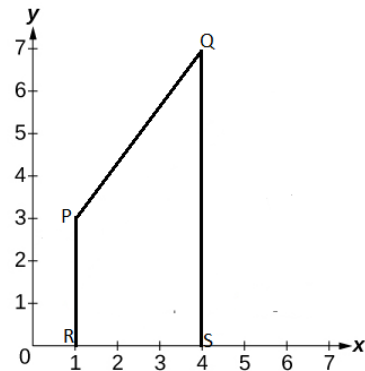
    a) -1   b) 0   c) 1   d) 2

146. If A(1,1) B(0,0) and C(a,b) then the correct relation among the following is _____

    a) a=2b   b) a=b   c) b=2a   d) a=-b

147. In the given figure the length of PQ IS

    a) 3 units   b) 4 units   c) 5 units   d) 6 units

Unit 7 : Quadratic Equations

148. If the roots of the equation $x^2 + 6x + k = 0$ are equal then the value of 'k ' is equal to _____

    a) 9   b) – 9   c) 8   d) 5

149. The standard form of quadratic equation is _____

    a) $ax^2 – bx + c = 0$ b) $ax^2 + bx + c = 0$ c) $ax^2 – bx - c = 0$ d) $ax^2 + bx - c = 0$

150. If one root of the quadratic equation $(x – 2)(x+1) = 0$ is 2 then the other root is _____

    a) 0   b) -1   c) 1   d) 3

151. The roots of the quadratic equation $ax^2 + bx + c = 0$ are _____

    a) $\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ b) $\dfrac{-b \pm \sqrt{a^2 - 4bc}}{2a}$ c) $\dfrac{-b \pm \sqrt{b^2 + 4ac}}{2a}$ d) $\dfrac{-b \pm \sqrt{a^2 + 4bc}}{2a}$

152. If the roots of the quadratic equation $x^2 – kx + 4 = 0$ are equal then the value of 'k' is _____

    a) ± 2 b) ± 4 c) ± 8 d) ± 16

153. The discriminant of the quadratic equation $x^2 + 5x + 6 = 0$ is _____

    a) 49   b) 25   c) 24   d) 1

154. The roots of the equation $x^2 – x – 6 = 0$ are _____

    a) (-2,3)   b) (-2,-3)   c) (2,3)   d) (2,-3)

155. The roots of the equation $(x – 1)(x – 2) = 0$ are _____

    a) -1,-2   b) 1,2   c) -1,2   d) -2,1

156. The discriminant of the quadratic equation $ax^2 + bx + c = 0$ is _____

    a) $b^2 + 4ac$ b) $b^2 – 4ac$ c) $\sqrt{b^2 + 4ac}$ d) $\sqrt{b^2 – 4ac}$

157. The standard form of the quadratic equation $x(x+1) = 30$ is _____

    a) $x^2 + x = 30$ b) $x^2 + x - 30 = 0$ c) $x^2 – x – 30 = 0$ d) $x^2 – x = 30$

158. If the roots of the quadratic equation are real then the value of its discriminant is _____

    a) Less than zero   b) Greater than or equal to zero   c) -1   d) None of the above

159. If the quadratic equation $ax^2 + bx + c = 0$ does not have real roots then $b^2 – 4ac$ is _____

    a) Less than zero   b) Greater than zero   c) Equal to zero   d) Equal to one

160. If the roots of the quadratic equation $ax^2 + bx + c = 0$ are equal then the value of $b^2 – 4ac$ is _____

    a) Less than zero   b) Greater than zero   c) Equal to zero   d) Equal to one

161. The roots of the equation $x^2 – 5x + 6 = 0$ are _____

    a) 2,3   b) -2,3   c) 2,-3   d) -2,-3

162. The roots of the equation $x^2 – 6x = 0$ are _____

    a) (0,-6)   b) (0,6)   c) (6,-6)   d) (-6,-6)

163. If (x+4) (x-4) =9 then the value of x is _____

    a) $\pm$ 5   b) $\pm \frac{1}{5}$ c) 5, 5   d) 4, -4

164. The quadratic equation whose roots are equal to 2 and -1 is _____

    a) $x^2 + 2x - 2 = 0$ b) $x^2 + x + 2 = 0$ c) $x^2 - 2x + 2 = 0$ d) $x^2 - x - 2 = 0$

165. If the roots of the equation $kx^2 + 2x + 3 = 0$ are equal the value of 'k' is _____

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

166. The discriminant of the equation $2x^2 - x - 8 = 0$ is _____

    a) -127   b) -65   c) -15   d) 65

167. If the discriminant of a quadratic equation $ax^2 + bx + c = 0$ is -3 then the roots of the equation are ____

    a) Real and distinct   b) No real roots

    c) Roots are equal   d) None of the above

168. The maximum number of roots that a quadratic equation can have is _____

    a) 1   b) 2   c) 3   d) Infinite

169. If one root of the equation $2x^2 + kx + 4 = 0$ is 2 then the value of 'k' is _____

    a) 6   b) -1   c) -2   d) -6

170. The standard form of the quadratic equation $x^2 = 3x + 2$ is _____

    a) $x^2 - 3x + 2 = 0$ b) $x^2 + 3x - 2 = 0$ c) $x^2 - 3x - 2 = 0$ d) $x^2 + 3x + 2 = 0$

171. If one root of the equation (3x - 2)(x+3) = 0 is -3 then the other root is _____

    a) $\frac{2}{3}$ b) $\frac{3}{2}$ c) $\frac{-2}{3}$ d) $\frac{-3}{2}$

172. The standard form of the equation $2x^2 - 5(4x-1) = 0$ is _____

    a) $2x^2 - 20x - 5 = 0$ b) $2x^2 - 20x + 5 = 0$ c) $2x^2 + 20x - 5 = 0$ d) $2x^2 + 20x + 5 = 0$

173. The nature of the roots of the equation $2x^2 - x - 3 = 0$ is _____

    a) Roots are equal   b) Roots are real and distinct

    c) No real roots   d) Roots are irrational

174. The sum of the squares of two consecutive even numbers is 164. Its mathematical representation is _____

    a) $x^2 + (x+1)^2 = 164$ b) $x^2 + (x+2)^2 = 164$ c) $[x+(x+2)]^2 = 164$ d) $x^2 + (2x)^2 = 164$

175. The sum of the squares of two consecutive odd numbers is 130. Its mathematical representation is _____

    a) $x^2 + (x+1)^2 = 130$ b) $x^2 + (2x)^2 = 130$ c) $x^2 + (x+2)^2 = 130$ d) $(x+2x)^2 = 130$

Unit 8: Introduction to Trigonometry

176. The value of $\sin 60^0 \times \cos 30^0$ is _____

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

177. The value of $\sin (90^0-\theta)$ is _____

   a) $\cos \theta$ b) $\tan \theta$ c) $\sec \theta$ d) $\cot \theta$
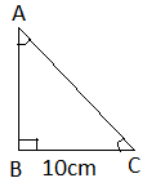
178. The value of $\tan 45^0$ is _____

   a) $\sqrt{3}$ b) 0`   c) 1 d) $\frac{1}{\sqrt{3}}$

179. The value of $\tan\theta - \cot(90^0- \theta)$ is _____

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

180. In the figure if $\angle B = 90^0$, $\angle A = \angle C$ and $BC = 10$ cm then the value of tan A is _____

   a) 0 b) 1 c) $\sqrt{3}$ d) $\frac{1}{\sqrt{3}}$

181. If $15 \cot A = 8$ then the value of tanA is _____

   a) 0 b) $\frac{8}{15}$ c) 1 d) $\frac{15}{8}$

182. If $\sqrt{3} \tan\theta = 1$ then the value of θ is _____

   a) 30^0 b) 45^0 c) 60^0 d) 90^0

183. The value of $\tan 45^0 + \cot 45^0$ is _____

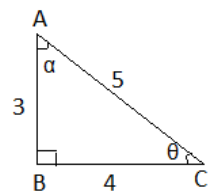   a) 0 b) 1 c) 2 d) N.D.

184. The value of $\cot (90^0-30^0)$ is _____

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

185. In the figure if $\angle B = 90^0$, $\angle C= \theta$, $\angle A = \alpha$ then the value of $\sin \alpha + \cos \theta$ is _____

   a) $\frac{6}{5}$ b) $\frac{8}{5}$ c) $\frac{7}{5}$ d) $\frac{3}{4}$

186. The value of $\frac{\sin 80^0}{\cos 10^0}$ is _____

   a) -1 b) 0 c) 1 d) N.D.

187. If $3\tan \theta = 3$ then the value of acute angle θ is _____

   a) 90^0 b) 60^0 c) 45^0 d) 30^0

188. The value of $\cos^2 \theta + \cos^2 (90^0 - \theta)$ is _____

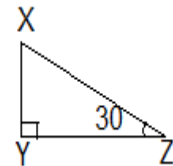   a) 2 b) 1 c) 0 d) -1

189. $(1+\cos \theta)(1-\cos \theta) =$

   a) $\sin^2\theta$ b) $\cos^2\theta$ c) $\sec^2\theta$ d) $\tan^2\theta$

190. In the given figure if $\angle Y = 90^0$, $\angle Z=30^0$ and XY=5cm then the length of XZ is

   _____

   a) 5cm   b) 10cm   c) 15cm   d) 20cm

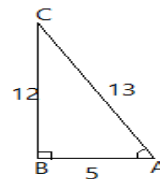191. If $\sin 18^0 = \cos A$ and A is an acute angle then $\angle A = $ _____

   a) 90^0 b) 82^0 c) 72^0 d) 36^0

192. If $5 \sin A = 3$ then $\csc A = $ _____

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

193. In triangle ABC if $\angle B = 90^0$ then $\tan A = $ _____

   a) $\frac{13}{5}$ b) $\frac{5}{12}$ c) $\frac{12}{5}$ d) $\frac{5}{13}$

194. $\frac{1-\sin^2 A}{1-\cos^2 A} = $ _____

   a) $\cot^2 A$ b)$\tan^2 A$ c)$\sec^2 A$ d) $\csc^2 A$

195. In triangle ABC if $\angle A = 90^0$ then $\sin B = $ _____

   a) $\frac{AC}{AB}$ b) $\frac{BC}{AC}$ c) $\frac{AC}{BC}$ d) $\frac{AB}{BC}$

196. The value of $\cos^2 17^0 - \sin^2 73^0$ is _____

   a) 1   b) $\frac{1}{3}$ c) 0   d) -1

197. The value of $\tan 10^0 \times \tan 80^0$ is _____

   a) -1   b) 1   c) 0   d) $\sqrt{3}$

198. $\frac{1- \tan^2 45}{1+ \tan^2 45} = $ _____

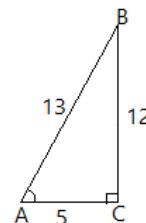   a) 0   b) 1   c) -1   d) $\frac{1}{2}$

199. $\frac{\tan 55^0}{\cot 35^0} = $ _____

   a) 0   b) 1   c) -1   d) $\frac{1}{\sqrt{3}}$

200. In the figure if $\angle C = 90^0$ then $\cot A = $ _____

   a) $\frac{12}{13}$ b) $\frac{5}{13}$ c) $\frac{13}{5}$ d) $\frac{5}{12}$

201. If $\sin \alpha = \frac{1}{2}$ and $\cos \beta = \frac{1}{2}$ then $\alpha+\beta = $ _____

   a) 0^0 b)30^0 c) 60^0 d) 90^0

202. The trigonometric ratio equivalent to $\frac{1}{\sqrt{3}}$ is _____

   a) $\sin 30^0$ b) $\cos 60^0$ c) $\tan 30^0$ d) $\tan 60^0$

203. The value of $10\sin^2\theta + 10\cos^2\theta$ is _____

    a) 10   b) 1   c) 0   d) $\frac{1}{10}$

204. $\cos48^0 - \sin42^0 =$ _____

    a) 6   b) 1   c) 0   d) -1

205. $\sec(90^0-A) =$ _____

    a) cos a   b) sin a   c) cot a   d) cosec a

206. $\frac{cosec\ 31^0}{sec\ 59^0} =$ _____

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

207. The value of $\sin^2 60^0$ is _____

    a) $\frac{\sqrt{3}}{2}$ b) $\frac{3}{4}$ c) $\frac{4}{3}$ d) $\frac{2}{\sqrt{3}}$

208. $1+\cot^2A =$ _____

    a) $\csc^2A$ b) $\cos^2A$ c) $\sec^2A$ d) $\tan^2A$

209. $\sec^2A =$ _____

    a) $1+ \cot^2A$ b) $1+ \tan^2A$ c) $1+ \csc^2A$ d) $1+ \cos^2A$

210. $\sec^2A - \tan^2A =$ _____

    a) 0   b) 1   c) -1   d) 2

211. Among the following the trigonometric ratios the ratio whose value is 1 is _____

    a) $\sin 30^0$ b) $\cos 30^0$ c) $\sin 0^0$ d) $\cos 0^0$

212. $\sin 30^0 + \cos 60^0 =$ _____

    a) 1   b) 0   c) $\frac{1}{4}$ d) $\frac{1}{2}$

213. If 5 sec A = 11 then cosA = _____

    a) $\frac{11}{5}$ b) $\frac{5}{11}$ c) $\frac{1}{2}$ d) 1

214. In the figure if $\angle B = 90^0$ $\angle A = \theta$ (θ is an acute angle) then cos $(90^0-\theta) =$ _____
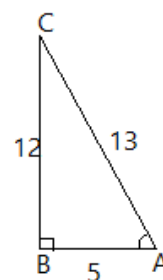
    a) $\frac{12}{13}$ b) $\frac{5}{13}$ c) $\frac{13}{5}$ d) $\frac{12}{13}$

215. If 2 cos θ = 1 then θ =

    a) 90^0 b) 60^0 c) 45^0 d) 30^0

216. If $\sqrt{2}$ cos θ = 1 then θ =

    a) 30^0 b) 45^0 c) 60^0 d) 90^0

217. If $\sqrt{3} \tan \theta = 1$ then $\theta =$ _____

    a) 90^0 b) 60^0 c) 45^0 d) 30^0

218. In the figure $\angle B = 90^0$, if $\angle A$ is an acute angle then $\sin(90^0 - A) =$

    a) $\dfrac{3}{5}$ b) $\dfrac{4}{5}$ c) $\dfrac{5}{4}$ d) $\dfrac{5}{3}$

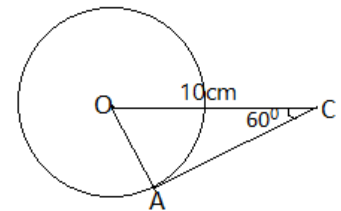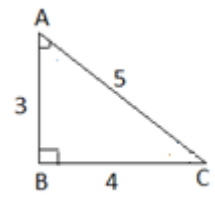219. If $\cos A + \cos^2 A = 1$ then the value of $\sin^2 A + \sin^4 A$ is _____

    a) 3   b) 2   c) 1   d) $\dfrac{1}{2}$

220. In the figure 'O' is the centre, AC is the tangent. If OC=10cm then the length of the radius OA= ____

    a) $10\sqrt{3}$ cm   b) $5\sqrt{3}$ cm

    c) 5cm   d) $4\sqrt{3}$ cm

Unit 9: Some Applications of Trigonometry

221. If a pole of height $4\sqrt{3}$ m from the ground casts a shadow of length 4m, then its angle of elevation towards the sun is _____

    a) 30^0 b) 45^0 c) 60^0 d) 90^0

222. From a point on the ground 30m away from the foot of the tower, if the angle of elevation of the top of the tower is 45^0 then the height of the tower is _____

    a) 60m   b) 45m c) 30m   d) $30\sqrt{3}$m

223. The angle of depression from point A are $\angle DAC = 30^0$, $\angle DAE = 45^0$ then the angle of elevation from point C is

    a) 15^0 b) 30^0 c) 45^0 d) 75^0

224. A 10m long rope is tied from a pole of height 5m to the ground. The angle of elevation made by the rope with the ground is _____

    a) 15^0 b) 30^0 c) 45^0 d) 60^0

225. If the angle of elevation of the sun is 45^0 then the length of the shadow cast by a 15m tall building is

_____

    a) 25m   b) 20m   c) 15m   d) 10m

226. If the height of the pole and the shadow cast by it are in the ratio $\frac{1}{\sqrt{3}}$ then the angle of elevation formed is

_____

    a) 30^0 b) 45^0 c) 60^0 d) 90^0

227. If the length of the shadow cast by a building is 20m and angle of elevation from the tip of the shadow to the top of the building is 60^0 then the height of the building is _____

    a) 20m   b) $20\sqrt{3}$m   c) 25m   d) $30\sqrt{3}$m

228. If a pole of height 2m casts a shadow of length $2\sqrt{3}$m, then the angle of elevation towards the tip of the pole from the tip of the shadow is _____
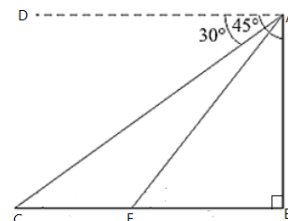
    a) 30^0 b) 45^0 c) 60^0 d) 90^0

229. If the height of a pillar is equal to the length of the shadow cast by it then the angle of elevation of the top of the pillar is _____

    a) 30^0 b) 45^0 c) 60^0 d) 90^0

230. The angle of elevation formed by the shadow of a pole to the top of the pole is 30^0. If the height of the pole is 100m then the length of the shadow cast by it is _____

    a) $100\sqrt{3}$m   b) 100m   c) $100(\sqrt{3}-1)$m   d) $\frac{100}{\sqrt{3}}$m

231. From the point 15m away from the foot of the pole of height 50m the angle of elevation to the top of the pole is _____.

   a) 15^0 b) 30^0 c) 45^0 d) 60^0

232. A kite is flying at a height of 75m above the ground. If the inclination of the string of the kite with the ground is 60^0 then the length of the string is _____

   a) $50\sqrt{2}$ m   b) $50\sqrt{3}$ m   c) $\frac{50}{\sqrt{2}}$m   d) $\frac{50}{\sqrt{3}}$m

233. If the angle of depression of a ship as observed from the top of a 75m high light house is 30^0 then the distance between the ship and the light house is _____

   a) $25\sqrt{3}$ m   b) $75\sqrt{3}$ m   c) $\frac{75}{\sqrt{2}}$m   d) $75\sqrt{2}$ m

234. A ladder placed along the wall makes an angle of 60^0 with the the ground. If the foot of the ladder is 8m away from the wall then the height of the wall is _____

   a) 4m   b) 8m   c) $8\sqrt{2}$m   d) 16m

235. The angle of depression of a car which is at a distance of $10\sqrt{3}$m from the foot of the building which is 10m tall is _____

   a) 30^0 b) 45^0 c) 60^0 d) 90^0

236. If the angle of depression of a boat from the top of a bridge of height 50m is 30^0, then the distance of th boat from the bridge is _____

   a) $50\sqrt{3}$ m   b) 50m   c) $25\sqrt{3}$ m   d) 25m
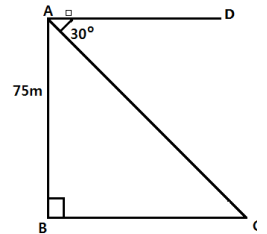
Unit 10 : Statistics

237. The empirical relationship between the three measures of central tendency is _____
   a) 2 Median = Mode +3Mean   b) 3Median = Mode + 2 Mean
   c) Median = Mode + Mean   d) Median = Mode – Mean

238. The median of the data 5,3,14,16,19 and 20 is _____
   a) 14   b) 14.5   c) 15   d) 16

239. The midpoint of the class interval (10 – 25) is _____
   a) 18   b) 17.5   c) 17   d) 15

240. The mean of the data 1, 2, 3, 4, 5 is _____
   a) 15   b) 7.5   c) 3.5   d) 3

241. The mode of the following frequency distribution is _____

X	5	10	15	20	25
f	2	8	3	10	5

   a) 25   b) 20   c) 15   d) 10

242. In the frequency distribution of grouped data if $\sum f_i x_i = 400$ and $\sum f_i = 20$ then its mean is _____
   a) 20   b) 25   c) 40   d) 800

243. The median of the data 15, 17, 19, 14, 12 is _____
   a) 17   b) 15   c) 14   d) 13

244. The mean of the first five prime numbers is _____
   a) 5.7   b) 5.6   c) 5.5   d) 5

245. If for certain data the mean is 16 and median is 15 then the mode is equal to _____
   a) 10   b) 11   c) 12   d) 13

246. The mode of the data 1, 0, 2, 2, 3, 1, 4, 5, 1, 0 is _____
   a) 3   b) 2   c) 1   d) 0

247. If the point of intersection of 'less than ogive' and 'more than ogive' of a given frequency distribution
   is (30, 40) then the median will be _____
   a) 30   b) 35   c) 40   d) 70

248. The value that repeats most often in given set of data is _____
   a) Mean   b) Median   c) Mode   d) None of the above

249. The mean of 50 and 20 is _____
   a) 70   b) 35   c) 30   d) 20

250. Which among the following is not a measure of central tendency?

    a) Mean   b) Median   c) Mode   d) Range

251. If the mean of the data 11, 8, 9, 12 and x is 10 then the value of 'x 'is _____

    a) 8   b) 9   c) 10   d) 11

252. In a group of data, the mode is _____

   a) Score which is repeated less number of times   b) Middle Score

   c) Most frequently repeated score   d) None of the above

253. If the mode of 16, 15, 17, 16, 15, x,19, 17, 14, 8 is 15 then x = _____

    a) 19   b) 15   c) 14   d) 8

254. If a certain group of data has its mean as 24 and mode as 12 then its median is _____

    a) 25   b) 22   c) 20   d) 18

255. The mean of first 5 odd numbers is _____

    a) 4   b) 5   c) 6   d) 7

256. The size of the class interval (40-50) is _____

    a) 10   b) 40   c) 45   d) 50

257. The formula to calculate the mode is _____

    a) $1 + \left[\frac{f_1 - f_0}{f_1 - f_0 - 2f_2}\right]h$ b) $1 + \left[\frac{2f_1 - f_0}{f_1 - f_0 - f_2}\right]h$ c) $1 + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right]h$ d) $1 + \left[\frac{f_1 - f_0}{2f_1 + f_0 - 2f_2}\right]h$

258. The class interval which contains the mode in the following frequency distribution

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	3	9	15	30	18	5

    a) (20-30)   b) (30-40)   c) (40-50)   d) (50-60)

259. In the given frequency distribution table if mode lies in the class interval (30-40) then which of the following is correct?

Class Interval	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	x	4	2

    a) $x < 8$ b) $x < 4$ c) $x < 5$ d) $x > 8$

260. In the following distribution table the class-interval which contains the mode is _____

Class Interval	10-15	15-20	20-25	25-30	30-35
Frequency	10	12	15	8	13

    a) 15   b) 13   c) 12   d) 8

261. In the following distribution table the class-interval which contains the median is _____

Class Interval	Frequency	Cumulative Frequency
10-20	7	7
20-30	12	19
30-40	11	30
40-50	18	48
50-60	12	60

a) 20 – 30
b) 30 – 40
c) 40 – 50
d) 50 – 60

262. The formula to calculate the median is _____

a) $1 + \left[\frac{\frac{n}{2} - C_f}{f}\right] h$

b) $1 + \left[\frac{\frac{n}{2} + C_f}{f}\right] h$

c) $1 + \left[\frac{\frac{n}{4} - C_f}{f}\right] h$

d) $1 + \left[\frac{\frac{n}{3} - C_f}{f}\right] h$

263. In the following frequency distribution table the value of 'l' when calculating the mode is _____

Class Interval	40-50	50-60	60-70	70-80	80-90
Frequency	7	10	8	6	5

a) 40   b) 50   c) 60   d) 70

264. The marks scored by a student in 6 subjects are 27, 30, 45, 60, 35 and x. If the mean of all scores is 42 then the value of x is _____

a) 40   b) 42   c) 55   d) 52

Unit 11: Surface Areas and Volumes

265. Volume of a cylinder is 300 m³. Volume of the cone whose radius and height is equal to that of the cylinder is _____

    a) 900m³   b) 600m³   c) 150m³   d) 100m³

266. Surface Area of a sphere whose radius is 7cm is _____

    a) 154cm²   b) 308 cm²   c)616 cm²   d) 770 cm²

267. The formula to calculate the Curved Surface Area of the frustum of a cone is _____

    a) $\pi(r_1^2 + r_2^2)l$ b) $\pi(r_1 - r_2)l$ c) $\pi(r_1 + r_2)l$ d) $\pi(r_1^2 - r_2^2)l$

268. Formula to calculate the Total Surface Area of a right circular cylinder is _____

    a) $\pi r^2 h$ b) $2 \pi r(r+h)$ c) $\pi r(r+h)$ d) $2\pi r^2(r+h)$

269. Formula to find the volume of a solid sphere _____

    a) $\frac{2}{3}\pi r^3$ b)$\frac{1}{3}\pi r^3$ c)$\frac{4}{3}\pi r^3$ d)$\frac{1}{3}\pi r^2$

270. Mathematical relationship between slant height (l), height (h) and radius (r) of a cone _____.

    a) $l^2 = h^2 + r^2$ b) $l^2 = h^2 - r^2$ c) $l^2 = r^2 - h^2$ d) $l = \sqrt{h^2 - r^2}$

271. If the radius of the cone is 'r', height is 'h' then the slant height is $l =$ _____

    a) $\sqrt{h^2 - r^2}$ b) $\sqrt{r^2 - h^2}$ c) $\sqrt{h^2 + r^2}$ d) $\sqrt{(r + h)^2}$

272. Lateral Surface Area of a cube whose volume is 27 cm³ is _____

    a) 36 cm²   b) 54 cm²   c) 63 cm²   d)108 cm²

273. A sphere of radius 'r' cm is melted to form a cone 'R' cm and height 'h' cm then the correct relation is _____

    a) $\frac{4}{3}\pi r^3 = \frac{1}{3}\pi R^3 h$ b) $\frac{4}{3}\pi r^3 = \frac{1}{3}\pi R^2 h$ c) $\frac{2}{3}\pi r^3 = \frac{1}{3}\pi R^2 h$ d) $\frac{1}{3}\pi r^3 = \frac{4}{3}\pi R^2 h$

274. Perimeter of a base of a cylinder is 24 cm, height is 8cm then the Curved Surface Areas will be __

    a) 136 cm²   b) 160 cm²   c) 190 cm²   d) 192 cm²

275. A cuboid of dimensions 12cm x 6cm x 3cm is melted to form a cube, then the edge of each face of the cube is _____.

    a) 21cm   b) 12cm   c) 6cm   d) 3cm

276. Volume of the frustum of a cone whose height is 'h' and radii of two circular ends are r_1 and r_2 is _____

    a) $\frac{1}{3}\pi h(r_1 + r_2 + r_1 r_2)$ b) $\frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1^2 r_2^2)$

    c) $\frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1 r_2)$ d) $\frac{1}{3}\pi h(r_1 + r_2 + r_1^2 r_2^2)$

277. Curved Surface Areas of a cone whose radius of the base is 7cm, and slant height 10cm is _____

a) 110cm^2 b) 210cm^2 c) 220cm^2 d) 240cm^2

278. A metallic sphere of radius 'R' cm is melted to form a metallic wire of radius 'r' cm and length 'h' cm. The correct relation among the following is _____

   a) $\frac{4}{3}\pi R^3 = \frac{1}{3}\pi r^2 h$ b) $\frac{4}{3}\pi R^3 = \pi r^2 h$ (c) $\frac{1}{3}\pi R^3 = \frac{4}{3}\pi r^2 h$ (d) $\frac{2}{3}\pi R^3 = \pi r^2 h$

279. A solid cone is melted to from a cylinder whose radius is equal to that of the cone. If the height of the cylinder is 5 cm, then the height of the cone is _____

    a) 18cm   b) 15cm   c) 12cm   d) 10cm

280. The ratio of the volumes of two spheres is 64:27 respectively. The ratio of their radii is _____

    a) 3:4   b) 4:3   c) 9:16   d) 16:9

281. A Sphere of radius 'r' units is converted into a cone of height 'r' units. Radius of the cone is _____

   a) r units   b) 2r units   c) 3r units   d) 4r units

282. Total Surface Area of a solid hemisphere is _____

   a) $4\pi r^2$ b) $3\pi r^2$ c) $2\pi r^2$ d) $\frac{4}{3}\pi r^2$

283. A pencil sharpened at one edge is a combination of _____

   a) Frustum of a cone and a cylinder   b) Cone and cylinder

   c) Cylinder and Hemisphere   d) Cone and Hemisphere

284. A toy is prepared by mounting a cone on the hemisphere. Its Total Surface Area   is

   _____

   a) $3\pi r^2 + \pi rl$ b) $4\pi r^2 + \pi rl$ c) $2\pi r^2 + \pi rl$ d) $\frac{2}{3}\pi r^2 + \pi rl$
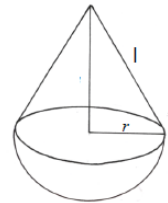
285. If the ratio of the radii of 2 spheres is 4:5 then the ratio of their areas is _____

   a) 4:5   b) 5:4   c) 16:25   d) 25:16

286. The combination of solids in this funnel is _____

   a) Cone and cylinder   b) Frustum of a cone and cylinder

   c) Cylinder and Hemisphere   d) Cone and Cuboid
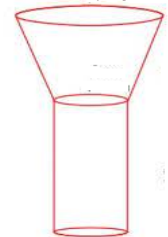
287. If the volume of two spheres is in the ratio 27:8 then the ratio of their radii is _____

   a) 2:3   b) 3:2   c) 4:9   d) 9:4

288. The correct formula to find the volume of the given combination of solids is _____

   a) $\frac{1}{3}\pi r^2 h + \frac{1}{3}\pi h(r^2 + r^2 + rr)$ b) $\frac{1}{3}\pi h(r^2 + r^2 + rr) + \pi r^2 h$

   c) $\frac{1}{3}\pi h(r^2 + r^2 + r^2 r^2) + \pi r^2 h$ d) $\frac{1}{3}\pi h(r^2 + r^2 + rr) + 2\pi rh$
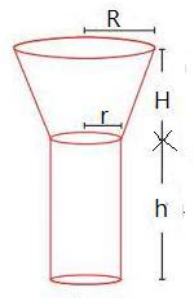
289. Number of lead sheets each of radius 2 cm can made by melting a sphere of radius 4cm is

_____

    a) 1   b) 2   c) 4   d) 8

290. The Combination of solids in the capsule is _____

    a) 2 cylinders   b) 2 hemispheres + cylinder

    c) 2 spheres + cylinder   d) 1 cylinder + 1 hemisphere

291. The surface area of the capsule whose radius is 'r' is _____

    a) $2 \text{x} 2\pi r^2 + 2\pi rh$ b) $2 \text{x} 3\pi r^2 + 2\pi rh$

    c) $2 \text{x} 2\pi r^2 + 2\pi r(r+h)$ d) $\frac{4}{3}\pi r^3 + \pi r^2 h$
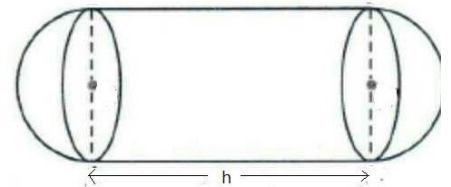
292. Total surface area of the cone whose radius is 'r', and slant height is 'l' is _____

    a) $\pi(r+l)$ b) $\pi r(r+l)$ c) $\pi l(r+l)$ d)$2\pi r(r+l)$

293. Volume of hemisphere whose radius 'r' units is _____

    a) $\frac{1}{3}\pi r^3$ b) $\frac{2}{3}\pi r^3$ c) $\frac{4}{3}\pi r^3$ d) $\frac{3}{2}\pi r^3$

294. The volume of this toy _____

    a) $\frac{2}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$ (b) $\frac{4}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$

    (c) $\frac{1}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$ (d) $\frac{2}{3}\pi r^3 + \frac{2}{3}\pi r^2 h$
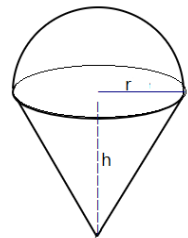
295. The volume of the cuboid whose dimensions are (5 x 6 x 3) is _____

    a)180 cubic units   b) 120 cubic units

    c) 90 cubic units   d) cubic units   [-c x9

296. Surface area of the sphere whose radius is 7cm is _____

    a) 616 cm²   b) 432 cm²   c) 343 cm²   d) 312 cm²

297. Curved surface area of a hemisphere whose radius is 7cm is _____

    a) 324cm²   b) 316 cm²   c) 312 cm²   d) 308 cm²

298. Total surface area of the hemisphere whose radius is 7cm is _____

    a) 412cm²   b) 432 cm²   c) 462 cm²   d) 484 cm²

299. Curved Surface Area of the cylinder whose radius is 7cm and height is 10 cm is _____

    a) 220 cm²   b) 410 cm²   c) 432 cm²   d) 440 cm²

300. Total Surface Area of the water pipe whose radius is 'r' units and length is 'h' units _____

    a) $2\pi r(r+h)$ b) $2\pi rh$ c) $\pi r^2 + 2\pi rh$ d) $\pi r(r+h)$

301. If the perimeter of the base of the cylinder is 88cm and the height is 10cm, then the volume of the cylinder is _____

a) 1890π cm^3 b) 1940π cm^3 c) 1960π cm^3 d) 1960 cm^3

302. If the perimeter of the base of the cylinder is 22cm and height is 5cm then its Curved Surface Areas is _____

a) 45π cm^2 b) 35π cm^2 c) 35πcm^2 d) 25π cm^2

303. Taking some clay, a cone is formed. It is cut parallel to its base with a knife. When the smaller cone is separated the Total Surface Area of the solid that is remaining is _____

a) $\pi(r_1 + r_2)l$

b) $\pi(r_1 + r_2)l + \pi r_1^2 + \pi r_2^2$

c) $\frac{1}{3}\pi h (r_1^2 + r_2^2 + r_1 r_2)$

d) $\pi[(r_1 + r_2)l + \pi r_1^2 + \pi r_2^2$

ANSWERS

Unit 1 : Arithmetic Progressions

1. d)   17 ($a_n = 4n + 5$

     $a_3 = 4(3) + 5 = 12 + 5 = 17$

2. d)   8 ($x = \frac{2+14}{2} = \frac{16}{2} = 8$)

3. b)   4   ($a_n = 3n - 2$

     $a_2 = 3(2) - 2 = 6 - 2 = 4$)

4. c)   7($a_n = 2n - 1$

     $a_4 = 2(4) - 1 = 8 - 1 = 7$)

5. b)   3 [$d = a_2 - a_1 = a_3 - a_2 = -----$]

     [$d = 6-3 = 3$ (2nd term – 1st term) OR d= 9-6=3 (3rd term- 2nd term)]

6. b) $\frac{n(n+1)}{2}$

7. c)   35,30,25........(Common difference, d=30-35= 25-30=-5 is equal. In other options c.d is unequal)

     [A) d= 4-1 $\neq$ 6-4   B) d= 10-12 $\neq$ 14-10   D) d= 13-8 $\neq$ 19-13

          3$\neq$ 2   2$\neq$ 4   5$\neq$ 6]

8. c) $a_n = a + (n-1)d$

9. c)   3 [$a_n = (3n-1) \Rightarrow a_1 = 3(1)-1 = 3 -1 = 2$

     $a_2 = 3(2)-1 = 6 -1 = 5 \Rightarrow d = a_2 - a_1 = 5 - 2 = 3$

10. c) 55

$$S_n = \frac{n(n+1)}{2} = S_{10} = \frac{10(10+1)}{2} = \frac{\overset{5}{\cancel{10}} \times 11}{\underset{1}{\cancel{2}}} = 55$$

11. b) $- 2$ [$d = a_2 - a_1 = a_3 - a_2 = -----$]

     [d= 1-3 =-2 (2nd term – 1st term) OR d= -1-1=-2 (3rd term- 2nd term)]

12. a)   0   [$d = a_2 - a_1 = a_3 - a_2 = -----$]

     [d= $\frac{1}{2} - \frac{1}{2}$ = 0 (2nd term – 1st term) or d= $\frac{1}{2} - \frac{1}{2}$ = 0 (3rd term- 2nd term)]

13. c)   14   ($x = \frac{2+26}{2} = \frac{28}{2} = 14$)

14. b) $S_n = \frac{n}{2}(a+l)$

15. c) $S_n = \frac{n}{2}[2a+(n-1)d]$

16. d)   17,20,23,26 (d= $a_2 - a_1$= 5-2 =3

     Next 4 terms are = 14+3=17, 17+3=20, 20 =3 =23, 23+3=26)

17. b) 7 ($a_4=9$ and d=2 $\therefore$ $a_3=a_4-d = 9-2=7$

(To get previous term subtract d from that term)

18. c) 5($a_n = 13 - 2n$

$a_4 = 13-2(4) = 13 -8 =5$

19. a) $- 2$ (**a_3** =10, a_4 =8 $\therefore$ d = a_4- **a_3**= 8-10 =-2

20. d) -11,-16 (d= $a_2 - a_1$= -1 -4 =-5

Next 2 terms are = -6-5 =-11 and -11-5 =-16)

21. d) 12 (= $a_1 + a_2 + a_3$ = 1+4=7 = 12)

22. b) 6 (a= 1 a_n= 11 S_n =36 $S_n =\frac{n}{2}$(a+a_n)

$$36 = \frac{n}{2}(1+11) = \frac{n}{2}(12)^{\!6}$$

$$6n =36$$

$$n = \frac{36^{\,6}}{\cancel{6}_{\,1}} = 6$$

23. c) 1,3,5...........(a_n=2n-1

$a_1 = 2(1) - 1= 2-1 =1$

$a_2 = 2(2) -1 = 4-1 =3$

$a_3 = 2(3) -1 = 6-1 =5$

24. b) -2   (a_n=5-2n

$a_1 = 5-2(1)=3$ and a_2=5-2(2) =5-4=1 $\therefore$ d= a_2- a_1 = 1-3=-2

25. c) 10 , 14 (Answer by seeing the options)

26. c) 4 (10-6 =4, same difference continues)

27. b) 14 $S_n = 3n^2 + 5n$

S_1= $3(1)^2 + 5(1) = 3 + 5 = 8 = a_1$

S_2= $3(2)^2 + 5(2) = 12 + 10 =22 = a_1 + a_2$

$\therefore a_2 = 22 -8 = 14$

Unit 2 : Triangles

28. b) Thales.

29. a) $\frac{PT}{TR}$(According to BPT or Thales theorem, $\frac{PS}{SQ} = \frac{PT}{TR}$)

30. d) 16:81($4^2 : 9^2$, According to Areas of Similar Triangles theorem, The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides)

31. c) $\frac{AY}{AC}$ (According to BPT or Thales theorem $\frac{AX}{AB} = \frac{AY}{AC}$)

32. a) 7cm, 24cm, 25cm (According to Pythagoras theorem $7^2 + 24^2 = 25^2$
$49 + 576 = 625 \Rightarrow 625 = 625$)

33. c) 4:1 (Equilateral triangles are similar and D is midpoint of BC).

∴$BD = \frac{1}{2} BC \Rightarrow 2BD = BC$ ∴BC:BD = 2:1

Ratio of corresponding Sides = 2:1

∴The ratio of the areas of two similar triangles= $2^2 : 1^2 =$ **4:1**

∵The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding

sides.

OR

$\frac{\text{Area of }\Delta ABC}{\text{Area of }\Delta BDC} = \frac{BC^2}{BD^2} = \frac{(2BD)^2}{BD^2} = \frac{4BD^2}{BD^2} = \frac{4}{1}$

∴ Area of ΔABC:Area of Δ BDC = **4:1**

34. b) Pythagoras

35. d) In same ratio

36. b) 1:2 (According to Areas of Similar Triangles theorem, $\frac{\text{Area of }\Delta ABC}{\text{Area of }\Delta DEF} = \frac{BC^2}{EF^2} = (\frac{BC}{EF})^2$

$\frac{\text{Area of }\Delta ABC}{\text{Area of }\Delta DEF} = (\frac{BC}{EF})^2 = \frac{120}{480} = \frac{1}{4}$

∴ $\frac{BC}{FF} = \sqrt{\frac{1}{4}} = \frac{1}{2}$)

37. d) $AC^2 - BC^2 = AB^2$(According to Pythagoras theorem $AC^2 = AB^2 + BC^2$
$\Rightarrow AC^2 - BC^2 = AB^2$)

38. d) $\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$ (Corresponding sides of similar triangles are in same ratio.

Corresponding sides AB → PQ, BC → QR, and AC→ PR)

39. c) $\frac{BC^2}{EF^2}$(According to Areas of Similar Triangles theorem $\frac{\text{Area of }\Delta ABC}{\text{Area of }\Delta DEF} = \frac{AB^2}{DE^2} = \frac{BC^2}{EF^2} = \frac{AC^2}{DF^2}$

40. a) 3:4(According to Areas of Similar Triangles theorem, $\dfrac{Area\ of\ \Delta\ ABC}{Area\ of\ \Delta\ DEF} = \dfrac{BC^2}{EF^2} = (\dfrac{BC}{EF})^2 = \dfrac{9}{16}$

$\Rightarrow \dfrac{BC}{EF} = \sqrt{\dfrac{9}{16}} = \dfrac{3}{4}$)

41. c) 12cm (According to Pythagoras theorem, $AB^2 + BC^2 = AC^2$

$5^2 + BC^2 = 13^2$

$\Rightarrow BC^2 = 13^2 - 5^2$

$= 169 - 25 = 144$

$\Rightarrow BC = \sqrt{144} = 12$)

42. d) 96cm^2(According to Areas of Similar Triangles theorem, $\dfrac{Area\ of\ \Delta\ ABC}{Area\ of\ \Delta\ DEF} = \dfrac{BC^2}{EF^2}$

$\Rightarrow \dfrac{54}{Area\ of\ \Delta\ DEF} = \dfrac{3^2}{4^2}$

$\Rightarrow \dfrac{54}{Area\ of\ \Delta\ DEF} = \dfrac{9}{16}$

$\therefore$ Area of $\Delta DEF = \dfrac{54\ X\ 16}{9} = 96$ cm^2.

43. b) 4.5cm (According to BPT or Thales theorem, $\dfrac{AD}{DB} = \dfrac{AE}{EC}$

$\Rightarrow \dfrac{2}{3} = \dfrac{3}{EC} \Rightarrow EC = \dfrac{3\ X\ 3}{2} = \dfrac{9}{2} = 4.5$cm)

44. b) 90^0 ($AB^2 + BC^2 = 6^2 + 8^2 = 36 + 64 = 100$

$AC^2 = 10^2 = 100$

$\therefore AC^2 = AB^2 + BC^2 \therefore$ According to Pythagoras converse theorem, $\angle B = 90^0$)

45. a) 4cm ($BD^2 = AD\ X\ CD \Rightarrow BD^2 = 8\ X\ 2 = 16 \Rightarrow BD = \sqrt{16} = 4$cm)

46. b) 42m

Simple Method: Height --Shadow

6m → 4m
? → 28m
$\Rightarrow \dfrac{6\ x\ 28}{4} = 42$ m

OR

In Figure , According to Thales Theorem

$$\frac{AB}{DE} = \frac{BC}{EC}$$

$$\frac{AB}{6} = \frac{28^{\,7}}{4_{\,1}}$$

AB = 6 x 7 = 42 m
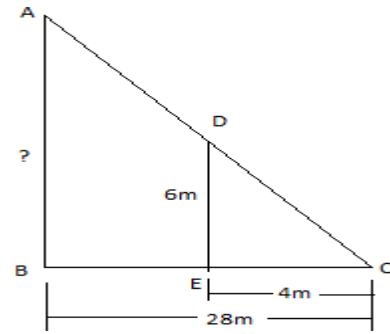
47. c) 10cm ($\Delta ABC \sim \Delta DEF \Rightarrow \frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} \Rightarrow \frac{5}{DE} = \frac{4}{8}$

$$\frac{5}{DE} = \frac{4}{8}_{\,2}$$

5 x 2 = DE $\Longrightarrow$ DE = 10cm

48. d) 1.8cm ($AB^2 = AD \times AC$

$3^2 = AD \times 5$

9 = 5AD $\Rightarrow$ AD = $\frac{9}{5}$ = 1.8)

49. d) 3cm ($\frac{DE}{AB} = \frac{EF}{BC} = \frac{DF}{AC} =$

$\frac{6}{AB} = \frac{8}{4} = \frac{10}{5} = 2 \Rightarrow AB = \frac{6}{2} = 3$)

50. a) 6.4cm ($BC^2 = AC \times CD$

$8^2 = 10 \times CD$

64 = 10 CD $\Rightarrow$ CD = $\frac{64}{10}$ = 6.4

51. b) 49:9 (AD:DB = 3:4 $\Rightarrow$ AD:AB = 3:7

$\Rightarrow$ AB:AD = 7:3 $\Rightarrow \therefore \Delta\ area(ABC) : \Delta\ area(ADE) = \mathbf{AB^2} : \mathbf{AD^2}$

$\qquad\qquad\qquad 7^2 : 3^2 \qquad\qquad = 49:9$

Unit 3 : Pair Of Linear Equations in Two Variables

52. b) 6 (Lines are coincident then, $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2} \Rightarrow \frac{1}{2}=\frac{2}{4}=\frac{3}{k}$

$\Rightarrow \frac{1}{2}=\frac{3}{k} \Rightarrow$ k= 3 X 2 =6

OR

We can understood in this way,

$1 \times 2 = 2 \Big($ $1x$ $+$ $2y$ $= 3 \Big)$ $2 \times 2 = 4$ $\Big)$ $3 \times 2 = 6$
$2x$ $+$ $4y$ $= k$

53. a) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

54. d) Infinite

$\Big(\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2} \Rightarrow \frac{2}{4}\Big)$ x2 $=\frac{3}{6}\Big)$ x2 $=\frac{-9}{-18}\Big)$ x2 $=\frac{1}{2}$;

∴ Lines are coincident ⇒Infinite many solutions.

55. c) 4(x + y = 7⇒ 3+ y = 7 ⇒ y= 7-3 =4

x + $\big($y$\big)$ = 7 $\boxed{y=4}$
3 + $\big($4$\big)$ = 7

56. a) $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$

57. a) $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$

58. c) 3 (Lines are coincident $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2} \Rightarrow \frac{2}{6}=\frac{-1}{-k}=\frac{4}{12}$ Numerator x **3**= Denominator

2x3=6   4x3=12

∴(-1)x**3** =-k=-3)

59. d) Infinite many solutions.

60. c) 4 (Lines are parallel then,$\frac{a_1}{a_2}=\frac{b_1}{b_2} \neq \frac{c_1}{c_2} \Rightarrow \frac{4}{4}=\frac{k}{4} \Rightarrow$ k=4

61. a) Intersecting (If lines are intersecting then,$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ here$\frac{6}{2} \neq \frac{2}{4}$ after simplification3 $\neq \frac{1}{2}$

62. a) (3,1)   (Easily identify the answer3+1 =4 and 3-1 =2)

Method :   x + y = 4 ----(1)

x − y = 2----(2)

2x = 6⇒ x = $\frac{6}{}$ = 3

Substitute x = 3 in equation (1),

3 + y = 4

y = 4 – 3 $\Rightarrow$ y = 1.

63. b) (2,1)   [2x+y=5 and x–y=1 Easily identify the answer]

2(2)+1 = 5 2 -1 =1]

Method :   2x + y = 5 ----(1)

x – y = 1----(2)

3x = 6$\Rightarrow$ x = $\frac{6}{3}$ = 2

Substitute x = 2 in equation (1),

2x2 + y = 5

4 + y = 5$\Rightarrow$ y = 5-4 $\Rightarrow$ y = 1

64. c)   2 (Substitute x = 3 in equation 2x + y = 8, we get 2(3) + y =8

6 +y =8 $\Rightarrow$y= 8 -6 =2)

65. b) 1 (Consistent pair of equations are intersect in a single point and $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$exactly one solutions)

66. c) $\frac{5}{6}$(we write equations in standard form(3x + 2y – 5=0and2x - y – 6 = 0) **c₁ = -5 c₂ = -6**

Then, $\frac{c_1}{c_2} \Rightarrow \frac{-5}{-6} = \frac{5}{6}$)

67. a) 10 (Pair of equations has no solution only if lines are parallel and $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$\frac{1}{5} = \frac{2}{k} \Rightarrow$ k= 5 x2 =10

68. c) Intersect each other $(\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$Unique solution)

69. c) No solutions (Lines are Parallel $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$then, No solutions)

70. c) 2 [Substitute y = 4in equation 3x + y = 10 we get, 3(x) + 4 =10

3x = 10 –4 = 6 $\Rightarrow$x= $\frac{6}{3}$ =2]

71. a) (3,3)

72. c) 4   (y = 2x – 3

5= 2x-3

5+3 = 2x $\Rightarrow$ 2x=8 $\Rightarrow$ x= $\frac{8}{2}$ =4)

73. c) (2,2)   2x-y=2; x-y=0 $\Rightarrow$ x=y

2x –x =2

$\therefore$ x=2 and y=2

74. b) (2,0)

75. b) 1 $2x-y=5$ [(3,a)]

   $2(3)-a =5 \Rightarrow 6-a=5 \Rightarrow 6-5=a \Rightarrow a=1$

76. d) No Solution (Parallel lines $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \Rightarrow \frac{1}{1} = \frac{1}{1} \neq \frac{3}{-7}$

   $\Rightarrow 1=1 \neq \frac{-3}{7}$

77. c) 6 (Parallel lines $\frac{1_1}{3} = \frac{4}{2k}$ $[\neq \frac{c_1}{c_2}]$

   $\Rightarrow 2k = 4 \times 3 = 12 \Rightarrow k= \frac{12}{2} =6$

78. b) x=2, y=1 ($4x - 3y = 5$ go through wit options)

   $4(2)- 3(1) =5$

   $8- 3 = 5$

79. c) Infinitely many solutions ($\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \Rightarrow \frac{3}{9} = \frac{4}{12} = \frac{-5}{-15} \Rightarrow \frac{1}{3} = \frac{1}{3} = \frac{1}{3}$ $\Rightarrow$ lines are coincde)

Unit 4 :Circles

80. a) Secant (In this figure Secant of the Circle intersects Circle at A and B)
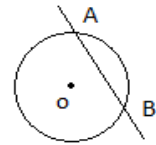
81. b) 1 (In this figure the tangent touching circle at one & only point P)
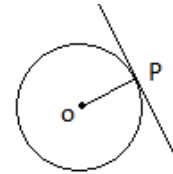
82. d) Infinite (There are infinite points on the circle. The tangent can be drawn at

each point

(In figure Some tangents have been drawn)
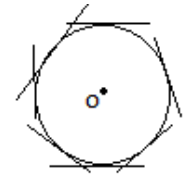
83. d) Infinite (Infinite diameter can be drawn in a Circle. The tangents drawn at the

end points of each diameter are parallel)
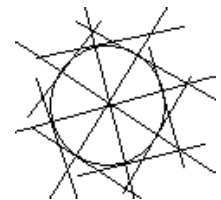
84. b) Point of contact (In the figure point of contact P is on the circle and the tangent)
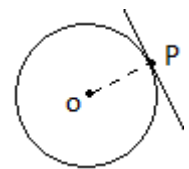
85. b) 4cm(This is application of Pythagoras theorem.**3, 4, 5**are Pythagorean triplets)

$AB^2 + OB^2 = OA^2$

$AB^2 + 3^2 = 5^2$

$AB^2 + 9 = 25 \Rightarrow AB^2 = 25-9 = 16$

$AB = \sqrt{16} = 4$
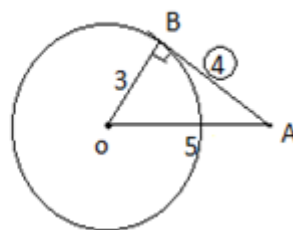
86. a) 7cm (This is application of Pythagoras theorem.**7, 24, 25**are Pythagorean triplets)

$OP^2 + PQ^2 = OQ^2$

$OP^2 + 24^2 = 25^2$

$OP^2 + 576 = 625 \Rightarrow OP^2 = 625 -576 = 49$

$OP = \sqrt{49} = 7$
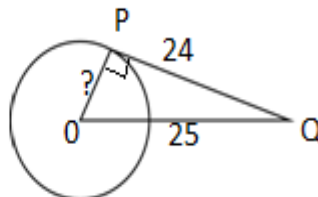
87. b) 70^0 (Angle between radii + Angle between tangents = 180^0)

∴Angle between tangents= 180-110 =70)

$\angle POQ + \angle PTQ = 180^0$

$110^0 + \angle PTQ = 180^0$

∴ $\angle PTQ = 180-110 = 70$

88. b) 50^0 (In figure

$\angle AOB + \angle APB = 180^0$

$\angle AOB + 80 = 180^0$

$\angle AOB = 180-80 = 100$

Now $\angle POA = \dfrac{100}{2} = 50^0$

)
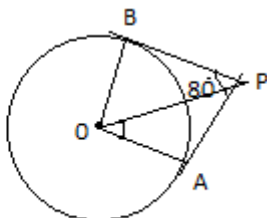
89. d) 3cm (This is application of Pythagoras theorem. **3, 4, 5** are Pythagorean triplets)

$AB^2 + OB^2 = OA^2$

$4^2 + OB^2 = 5^2$

$16 + OB^2 = 25 \Rightarrow OB^2 = 25-16 = 9$

$OB = \sqrt{9} = 3$
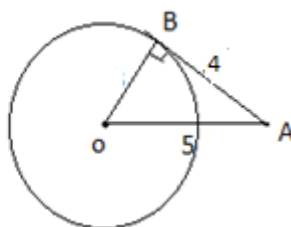
90. c) 40^0 (180- 100=80 $\angle OAB = \dfrac{80}{2} = 40^0$)

In the figure $\angle AOB + \angle OAB + \angle OBA = 180^0$

$100 + 2\angle OAB = 180$

$2\angle OAB = 180-100=80$

$\angle OAB = \dfrac{80}{2} = 40^0$

OA = OB (Radii)

∴ $\angle OAB = \angle OBA$
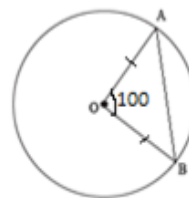
91. d) 90^0 (**Theorem: The tangent at any point of a circle is perpendicular to the radius through the point of centres**)

92. c) 2 (In figure PA and PB are tangents drawn from the external point P)
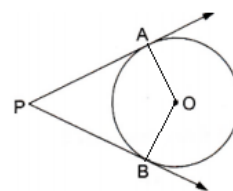
93. c) 180^0 (Angle between radii + Angle between tangents = 180^0)

94. d) 40^0

    In figure

$$\angle APB = 180^0$$

$$100 + \angle APB = 180^0$$

$$\angle APB = 180 - 100 = 80$$

$$\therefore \quad \angle APO = \frac{80}{2} = 40^0$$
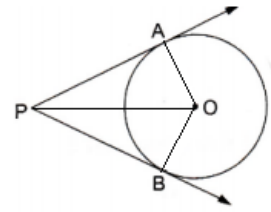
5. c) 40^0 (90- 50 = 40 $\because$ $\angle PAO$) = 90^0(Theorem)

    In figure$\angle POA = 50^0$

         i. $\angle PAO$) $= 90^0$(Theorem)

      $\angle POA + \angle PAO$) $+ \angle APO = 180^0$

      $50^0 + 90^0 + \angle APO = 180^0$

    $140 + \angle APO = 180^0 \Rightarrow \angle APO = 180 - 140 = 40$
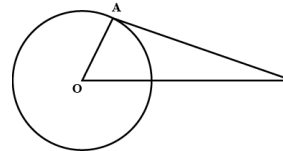
6. b) 1 (In figure Only one tangent can be drawn at the point)

7. b) 45^0 (In figure$\angle OAP = 90^0$

    $\angle AOP = \angle APO$(OA=PA)

    $\angle OAP + \angle AOP + \angle APO = 180^0$

    $90 + 2\angle AOP = 180$

    $2\angle AOP = 180 - 90 = 90 \Rightarrow \angle AOP = \frac{90}{2} = 45^0$
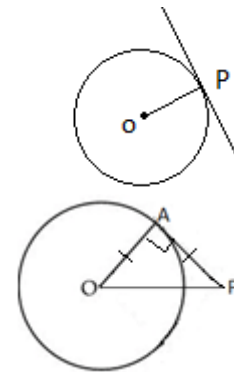
8. b) Equilateral triangle (The tangents drawn to a circle from an external point are equal and$\angle APB = 60^0$

9. d) 9 cm [PQ = 9cm$\Rightarrow$ PR=9cm (The tangents drawn to a circle from an external point are equal)

      $\angle PQR = 60^0 \Rightarrow \angle PRQ = 60^0$(base angles)$\Rightarrow \angle QPR = 60^0$(3rd angle of triangle)

      $\therefore$ QR = 9cm (ΔPQR equilateral triangle)

00. c) parallel (As showing the figure)
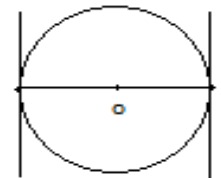
01. c) 90^0(Angle in a semi circle is right angle)

102. c) 55^0 (In figure PQ= PR(The tangents drawn to a circle from an external point are equal)

$\underline{PQR} + \angle PRQ = 180 - 70$ ($\angle QPR = 70^0$)

$2 \angle PQR = 110$ ($\angle PQR = \angle PRQ$)

$\angle PQR = \frac{110}{2} = 55^0$
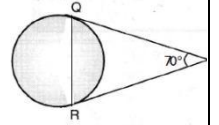
103. b) 7cm(In figure AD= AC+ CD   AC= AB ಮತ್ತು CD=DE

AD= AB+ DE   (The tangents drawn to a circle from

AD= 3+4 =7cm   an external point are equal)
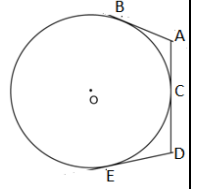
104. c) 8cm (TQ = 8 cm =TF   (Tangents drawn from exterior point to the largest circle

are equal)

TF = TR (Tangents drawn from exterior point to the smallest circle are

equal)

$\therefore$ TR= 8cm
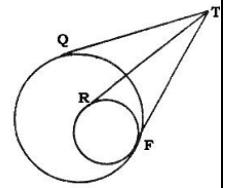
105. c) PQ (The largest chord of the circle is Diameter)

Unit 5 : Constructions

106. a) 3:2 (3 points on **AD** and 2 points on **BC**)

107. d) 4:3(Draw a figure and locate the point)

AB = 7 PB=3
then AP = 7-3 =4
AP: PB =4:3
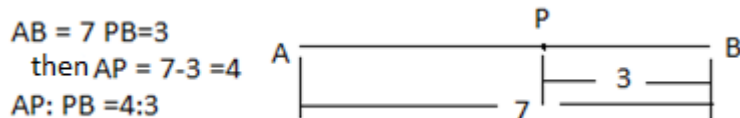
108. a) 3:4

109. b) 3:4(3 points on **AC**and 4 points on BD)

110. c) 8 (3+ 5 =8)

111. b) $\frac{3}{4}$(Joined A_4 & B $\therefore$Denominator=4 parallel line drawn from A_3 $\therefore$Numerator= 3 $\therefore$ $\frac{3}{4}$)

112. d) 120^0(Angle between the radii + Angle between tangents = 180^0

$\therefore$Angle between the radii = 180-60 =120)

113. b) 3:4 (Total 7 points on AX. Parallel line drawn from **3rd point to** A_7B and there are 4 points after

A_3.)

114. c) 80^0(Angle between the radii + Angle between tangents = 180^0

$\therefore$Angle between the radii= 180-100 =80)

115. a) 1 (In figure, We can draw only onetangent PQ through A)
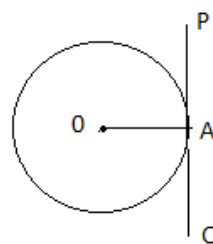
116. b) 3 cm, 3.6cm   BD= $\frac{3}{5}$AB=$\frac{3}{5}$ x 5 =3cm

DE = $\frac{3}{5}$AC=$\frac{3}{5}$ x 6 = $\frac{18}{5}$=3.6cm

117. c) 0 (Observe the figure,we annot draw any tangents from S)

118. a) 10cm, 7.5cm   BD=$\frac{5}{2}$BC =$\frac{5}{2}$ x 4 =10cm

BE = $\frac{5}{2}$AB=$\frac{5}{2}$ x 3 = $\frac{15}{2}$=7.5cm
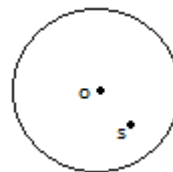
Unit 6 : Coordinate Geometry

119.   b)   3 units (The distance from the x axis to its point is the Y Co-ordinate)

120.   d)   (2, 0)(The y-coordinate of the point on the x-axis is 0(Zero))

121.   c) $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

122.   a) $\left(\frac{x_2+x_3}{2}, \frac{y_2+y_3}{2}\right)$

123.   c)   5 Units (The distance from the y axis to its point is the xcoordinate)

124.   a)   (0,0)

125.   c) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

126.   a) $\sqrt{x^2 + y^2}$

127.   a) $\frac{1}{2}\lfloor x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\rfloor$

128.   c)   5 Units ($\sqrt{x^2 + y^2} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$ (Application of Pythagoras Theorem)
             (We can also interpret that 3,4,5 are Pythagorian Triplets)

129.   b)   (2,5) $[\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = \left(\frac{1+3}{2}, \frac{4+6}{2}\right) = \left(\frac{4}{2}, \frac{10}{2}\right) = (2,5)]$

130.   d) $\sqrt{p^2 + q^2}$

131.   a)   5 Units ($\sqrt{x^2 + y^2} = \sqrt{4^2 + (-3)^2} = \sqrt{16 + 9} = \sqrt{25} = 5$
             (Application of Pythagoras Theorem)
             (We can also interpret that 3,4,5 are Pythagorean Triplets)

132.   a)   13 Units ($\sqrt{x^2 + y^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13$
             (We can also interpret that 5,12,13 are Pythagorean Triplets)

133.   b)   3 Units, 5 Units (The distance from the y-axis to the point is its x coordinate)
             1.   (The distance from the x-axis to the point is its y coordinate)

134.   b)   4 Units ($\sqrt{x^2 + y^2} = \sqrt{0^2 + 4^2} = \sqrt{0 + 16} = \sqrt{16} = 4$
             (The point along the y-axis is the distance from the origin to the y coordinate)

135.   a)   4 Units (The distance from the y-axis to the point is its x coordinate)
             (Distance is written positively though the coordinate is negative)

136.   b)   5 Units ($d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
             $d = \sqrt{(6 - 2)^2 + (6 - 3)^2}$
             $d = \sqrt{(4)^2 + (3)^2} = \sqrt{16 + 9} = \sqrt{25} = 5$ Units)

137.   b)   (x,0)

138.   c)   (0,0) (The point where the x axis and y axis meet is the origin point)

139. a) 0 (Zero)

140. d) 0 (Zero)

141. a) $\left(\frac{m_1x_2+m_2x_1}{m_1+m_2}, \frac{m_1y_2+m_2y_1}{m_1+m_2}\right)$

142. a) (2,0) (The y coordinate of each point on the x axis is 0(zero))

143. b) (0,-4) (The x coordinate of each point on the y axis is 0(zero))

144. b) (-5,2) $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = (x,y)$

$\frac{5+a}{2} = 0$ and $\frac{-2+b}{2} = 0$

$\implies$ 5+a =0 and -2+b =0

$\implies$ a= -5 and b=2

145. b) 0 $\frac{1}{2}[x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2)] = 0$ (A(2,3) B(4,k) C(6,-3))

$\frac{1}{2}[2(k-(-3)) + 4(-3-3) + 6(3-k)] = 0$

$\frac{1}{2}[2(k+3)) + 4(-6) + 6(3-k)] = 0$

$\frac{1}{2}[2k+6-24+18-6k] = 0$

$\frac{1}{2}[-4k] = 0 \implies 4k=0 \implies k=0$

146. b) a=b $\frac{1}{2}[x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2)] = 0$ [A(1,1) B(0,0) C(a,b)]

$$\frac{1}{2}[1(0-b) + 0(b-1) + a(1-0)]$$

$\frac{1}{2}[-b+0+a] = 0$

-b+ a =0 $\implies$ a=b

147. c) 5 units (Pythagoras Theorem in triangle PTQ)
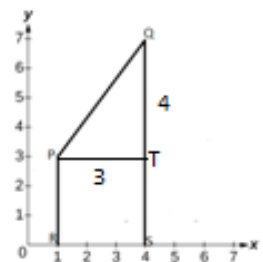
Unit 7 : Quadratic Equations

148. a) 9   (If roots are equal $b^2 - 4ac = 0$ Here a=1, b= 6, c= k

6² - 4(1)(k) =0

$36-4k=0 \Rightarrow 36=4k \Rightarrow k = \frac{36}{4} =9)$

149. b) $ax^2+bx+c=0$

150. b) -1 (x-2=0$\Rightarrow x$=2 Similarly x+1=0 $\Rightarrow x$=-1)

151. a) $\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

152. b) $\pm$ 4[If roots are equal $b^2 - 4ac =0$ (x² – kx + 4 = 0 ಇಲ್ಲಿ a=1, b=-k, c=4)

$(-k)^2 - 4(1)(4)=0$
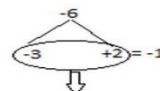
$k^2-16 =0 \Rightarrow k^2= 16 \Rightarrow k= \sqrt{16} \pm 4]$

153. d) 1   [x² +5x + 6 = 0 ಇಲ್ಲಿ a=1, b=5, c=8

Discriminant = $b^2 - 4ac = 5^2 -4(1)(6)$

= 25 – 24 =1

154. a) (-2,3)

155. b) 1,2 ((x –1)(x–2)=0 $\Rightarrow$ x-1=0 or x-2=0

x=1 or x=2)

156. b) $b^2 - 4ac$

157. b) $x^2 + x - 30 = 0$ (x(x+1) = 30
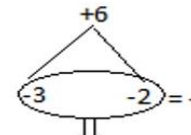
x²+x= 30 $\Rightarrow$ x²+x -30 =0

158. b) Greater than Zero or equal to Zero

159. a) less than Zero

160. c) equal to zero

161. a) 2,3

162. b) (0,6) ($x^2 - 6x = 0$

   x(x-6)=0

   x=0 or x-6=0 $\Rightarrow$x=6)

163. a) ± 5 (x+4) (x-4) =9 ((a+b)(a-b)=a^2-b^2

           $x^2 - (4)^2 = 9$

           $x^2 - 16 = 9$

           $x^2 = 16 + 9 = 25$

           x =$\sqrt{25}$ ± 5

164. d) $x^2 - x - 2 = 0$ (Quadratic Equation= x^2 –(sum of the roots)x + product of the roots =0

      $x^2 - [2+(-1)]x + 2(-1) = 0$

      $x^2 - (2-1)x - 2 = 0$

      $x^2 - 1x - 2 = 0 \Rightarrow x^2 - x - 2 = 0$

165. a) $\frac{1}{3}$ [If roots are equal, $b^2 - 4ac = 0$ ($kx^2 + 2x + 3 = 0$ Here a=k, b=2, c=3)

      $(2)^2 - 4(k)(3) = 0$

      $4 - 12k = 0 \Rightarrow 4 = 12k \Rightarrow$ k= $\frac{4}{12}$ = $\frac{1}{3}$

166. d) 65   ($2x^2 - x - 8 = 0$ Here a=2, b=-1, c=-8)

     Discriminant = $b^2 - 4ac = (-1)^2 - 4(2)(-8)$

             = 1 + 64 = 65

167. b) No real roots

168. b) 2

169. d) -6 ($2x^2 + kx + 4 = 0$ (Substituting x=2)

      $2(2)^2 + k(2) + 4 = 0$

      2(4) + 2k + 4 = 0

      8 + 2k + 4 = 0

      2k + 12 = 0 $\Rightarrow$ 2k =- 12 $\Rightarrow$ k = $\frac{-12}{2}$ = -6)

170. c) $x^2 - 3x - 2 = 0$

171. a) $\frac{2}{3}$ (3x - 2)=0 $\Rightarrow$3x=2 $\Rightarrow$ x = $\frac{2}{3}$)

172. b) $2x^2 - 20x + 5 = 0$ ($2x^2 - 5(4x-1) = 0$

       $2x^2 - 20x + 5 = 0$)

173. b) Distinct real roots (Discriminant = $b^2 - 4ac$ [$2x^2 - x - 3 = 0$ here a=2, b=-1, c=-3]

     = $(-1)^2 - 4(2)(-3)$

     = 1 + 24 = 25 > 0

174. b) $x^2+(x+2)^2=164$ (x and (x+2) are two consecutive even numbers)

175. c) $x^2+(x+2)^2=130$ (x and (x+2) are two consecutive odd numbers)

Unit 8 : Introduction to Trigonometry

176. c) $\frac{3}{4}($ sin 60^0 X cos $30^0)$

$\frac{\sqrt{3}}{2}$ X $\frac{\sqrt{3}}{2}= \frac{\sqrt{3}^2}{4}=\frac{3}{4})$

177. a) $\cos\theta($ Complementary angle)

178. c) 1

179. b) 0 $(\tan\theta$ - $\cot(90^0\text{-}\theta)$ $[\cot(90^0\text{-}\theta)=\tan\theta($ Complimentary angle)]

$\Rightarrow\tan\theta- \tan\theta = 0$)

180. b) 1 $(\angle A = \angle C \& \llcorner B = 90^0 \Rightarrow \angle A = \angle C = 45^0 \Rightarrow$, BC= AB = 10 cm

$\tan A = \frac{BC}{AB} = \frac{10}{10} = 1$ or $\tan 45^0 = 1$

181. d) $\frac{15}{8}$ (15 cot A = 8

cot A = $\frac{8}{15}$ $\Rightarrow$tan A = $\frac{15}{8}$(reciprocal ratio)

182. a) 30^0 $(\sqrt{3}\tan\theta = 1 \Rightarrow \tan\theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30^0$)

183. c) 2 $(\tan 45^0 + \cot 45^0 = 1 + 1 = 2$)

184. a) $\frac{1}{\sqrt{3}}$ $(\cot (90^0\text{-}30^0) = \tan 30^0 = \frac{1}{\sqrt{3}}$orcot $(90^0\text{-}30^0) =\cot 60^0 =\frac{1}{\tan 60} =\frac{1}{\sqrt{3}}$)

185. b) $\frac{8}{5}$ $(\sin\alpha + \cos\theta= \frac{4}{5} + \frac{4}{5}= \frac{8}{5})$

186. c) 1 ($\frac{\sin 80^0}{\cos 10^0} = \frac{\sin 80^0}{\sin (90-10)^0} = \frac{\sin 80^0}{\sin 80^0} = 1$)

187. c) $45^0(3 \tan\theta = 3 \Rightarrow \tan\theta = \frac{3}{3} \Rightarrow \tan\theta =1 \Rightarrow \theta= 45^0)$

188. b) 1 $(\cos^2\theta + \underline{\cos^2 (90^0\text{–}\theta)}$

$= \cos^2\theta+\sin^2\theta = 1$)

189. a) $\sin^2\theta[(1+\cos\theta)(1\text{-}\cos\theta) =(1)^2 - \cos^2\theta= 1 - \cos^2\theta= \sin^2\theta$]

190. b) 10cm ($\llcorner$Y = 90^0, $\angle$Z=30^0andXY=5cm sin$Z =\frac{Opposite\ side}{hypotenuse}= \frac{XY}{XZ}$

Sin $30^0=\frac{5}{XZ}$

$\frac{1}{2} =\frac{5}{XZ}$ $\Rightarrow$xz= 5X2 = 10cm

191. c) 72^0 ($\sin 18^0= \cos$ A,

$=\cos(90^0\text{-}18^0) =\cos$ A

$= \cos 72^0= \cos$ A$\Rightarrow\angle$A =$72^0)$

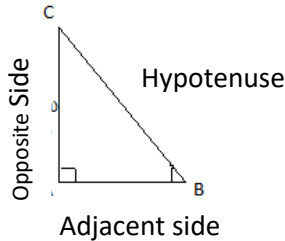**192.** d) $\frac{5}{3}$ (5 sin A = 3

$$\sin A = \frac{3}{5} \Rightarrow \cosec A = \frac{5}{3})$$

193. c) $\frac{12}{5}$ ($\tan A = \frac{Opposite\ side}{Adjacent\ side} = \frac{BC}{BA} = \frac{12}{5}$

194. a) $\cot^2 A$ ($\frac{1-\sin^2 A}{1-\cos^2 A} = \frac{COS^2 A}{Sin^2 A} = \qquad \cot^2 A$)

195. c) $\frac{AC}{BC}$ ($SinB = \frac{Opposite\ side}{hypotenuse} = \frac{AC}{BC}$)

Hypotenuse
Opposite Side
Adjacent side

196. c) 0 ($\cos^2 17^0 - \sin^2 73^0$

$$\cos^2 17^0 - \cos^2(90^0-73^0)$$

$$\cos^2 17^0 - \cos^2 17^0 = 0)$$

197. b) 1 ($\tan 10^0 \times \tan 80^0$

$\tan 10^0 \times \cot(90^0-80^0)$

$\tan 10^0 \times \cot 10^0$

$\cancel{\tan 10^0 \times} \frac{1}{\cancel{\tan 10^0}} = 1$)

198. a) 0 ($\frac{1-\tan^2 45}{1+\tan^2 45} = \frac{1-(1)^2}{1+(1)^2} = \frac{1-1}{1+1} = \frac{0}{1} = 0$)

199. b) 1 ($\frac{\tan 55^0}{\cot 35^0} = \frac{\tan 55^0}{(\tan(90^0-35^0)} = \frac{\tan 55^0}{\tan 55^0} = 1$)

200. d) $\frac{5}{12}$ ($Cot\ A = \frac{Adjacent\ side}{Opposite\ side} = \frac{5}{12}$ಅಥವಾ $\tan A = \frac{Opposite\ side}{Adjacent\ side} = \frac{12}{5} \therefore CotA = \frac{5}{12}$)

201. d) 90^0 ($\sin \alpha = \frac{1}{2} \Rightarrow \alpha = 30^0 \& \cos \beta = \frac{1}{2} \Rightarrow \beta = 60^0 \therefore \alpha + \beta = 30^0 + 60^0 = 90^0$)

202. c) $\tan 30^0$

203. a) 10 ($10\sin^2\theta + 10\cos^2\theta = 10(\sin^2\theta + \cos^2\theta\ 0 = 10(1) = 10$

204. c) 0 ($\cos 48^0 - \sin 42^0$

$\cos 48^0 - \cos(90^0-42^0)$

$\cos 48^0 - \cos 48^0 = 0$)

205. d) cosec A

206. c) 1 ($\frac{\cosec 31^0}{\sec 59^0} = \frac{\sec(90^0-31^0)}{\sec 59^0} = \frac{\sec 59^0}{\sec 59^0} = 1$)

207. b) $\frac{3}{4}$ ($\sin^2 60^0 = (\frac{\sqrt{3}}{2})^2 = \frac{3}{4}$)

208. a) $\csc^2 A$

209. b) $1 + \tan^2 A$

210. b) 1

211. d) $\cos 0^0$

212. a) 1 ($\sin 30^0 + \cos 60^0 = \frac{1}{2} + \frac{1}{2} = 1$)

213. b) $\frac{5}{11}$ (5 sec A = 11

$\qquad$ Sec A $= \frac{11}{5} \Rightarrow$ Cos A $= \frac{5}{11}$

214. a) $\frac{12}{13}$ ($\cos(90^0 - \theta) = \sin\theta = \frac{Opposite.side}{hypotenues} = \frac{12}{13}$)

215. b) 60^0 $\quad$ $2\cos\theta = 1 \Rightarrow \cos\theta = \frac{1}{2} \Rightarrow \theta = 60^0$

216. b) 45^0 $\quad$ $\sqrt{2}\cos\theta = 1 \Rightarrow \cos\theta = \frac{1}{\sqrt{2}} \Rightarrow \theta = 45$

217. d) 30^0 $\quad$ $\sqrt{3}\tan\theta = 1 \Rightarrow \tan\theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30^0$

218. b) $\frac{4}{5}$ $\quad$ $\sin(90^0 - A) = CosA = \frac{adjacent}{hypotenues} = \frac{4}{5}$

219. c) 1 $\qquad$ $\cos A + \cos^2 A = 1$

$\qquad$ $\Rightarrow CosA = 1 - \cos^2 A = \sin^2 A$ -----(1)

$\qquad$ now $\sin^2 A + \sin^4 A = \sin^2 A + (\sin^2 A)^2$

$\qquad\qquad\qquad = \cos A + \cos^2 A = 1$

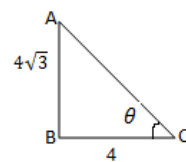**220.** b) $5\sqrt{3}$ cm $\qquad\qquad \angle A = 90^0$

$\qquad\qquad$ $\sin 60^0 = \frac{opposite}{hypotenues} = \frac{OA}{10}$

$\qquad\qquad$ $\Rightarrow \frac{\sqrt{3}}{2} = \frac{OA}{10} \Rightarrow OA = \frac{\sqrt{3}}{2} \times 10 = 5\sqrt{3}$
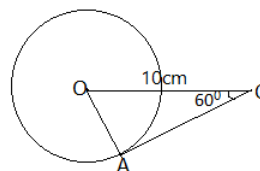
Unit 9 : Some applications of Trigonometry

221. c) 60^0 ($\tan\theta = \dfrac{Opp.side}{Adj.side} = \dfrac{4\sqrt{3}}{4} = \sqrt{3} \Rightarrow \theta = 60^0$

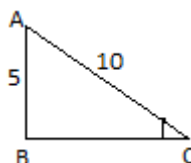**222.** c) 30m ($\tan45^0 = \dfrac{Opp.side}{Adj.side} = \dfrac{AC}{BC}$

$1 = \dfrac{AC}{30} \Rightarrow AC = 30m$

(Note :If angle is 45^0 then opposite side and adjacent sides are equal)

223. b) 30^0(Alternate angles)

224. b) 30^0($Sin\ C = \dfrac{Opp.side}{Hypo.} = \dfrac{AB}{AC} = \dfrac{5}{10} = \dfrac{1}{2}$

$Sin\ C = \dfrac{1}{2} \Rightarrow \angle C = 30^0$

225. c) 15m (If angle is 45^0 then opposite side and adjacent sides are equal)

$\tan45^0 = \dfrac{Opp.side}{Adj.side} = \dfrac{AC}{BC}$

$1 = \dfrac{15}{BC} \Rightarrow BC = 15m$
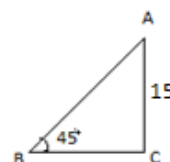
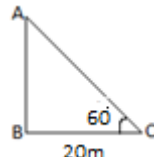**226.** a) 30^0($\dfrac{Height\ of\ the\ pole}{length\ of\ the\ shadow} = \dfrac{Opp.side}{Adj.side} = \dfrac{1}{\sqrt{3}} = \tan\theta \Rightarrow \theta = 30^0$

227. b) $20\sqrt{3}$m ($\tan60^0 = \dfrac{Opp.side}{Adj.side} = \dfrac{AB}{BC}$

$\sqrt{3} = \dfrac{AB}{20}$

$\Rightarrow \underline{20\sqrt{3} = AB}$

228. a) 30^0($\dfrac{Height\ of\ the\ pole}{length\ of\ the\ shadow} = \dfrac{Opp.side}{Adj.side} = \dfrac{2}{2\sqrt{3}} \Rightarrow \theta = 30^0$

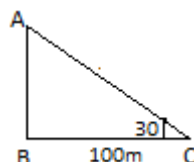$\Rightarrow \tan\theta = \dfrac{1}{\sqrt{3}} \Rightarrow \theta = 30^0$

229. b) 45^0(If opposite side and adjacent sides are equalthenangle is 45^0)

$(\tan\theta = \dfrac{Opp.side}{Adj.side} = 1 = \Rightarrow \theta = 45^0$

230. d) $\dfrac{100}{\sqrt{3}}$m($\tan30^0 = \dfrac{Opp.side}{Adj.side} = \dfrac{AB}{BC}$

$\dfrac{1}{\sqrt{3}} = \dfrac{AB}{100}$

$\Rightarrow \dfrac{100}{\sqrt{3}} = AB(\dfrac{100 X\sqrt{3}}{\sqrt{3} X \sqrt{3}} = \dfrac{100\sqrt{3}}{3}$

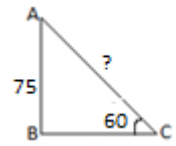**231.** c) 45^0 (If opposite side and adjacent sides are equalthen angle is 45^0)

$\left(\tan\theta=\dfrac{Opp.side}{Adj.side}=\dfrac{15}{15}=1 \Rightarrow \theta = 45^0 \right)$

232. b) $50\sqrt{3}$ Sin 60^0 = $\dfrac{Opp.side}{Hypo.}$ m
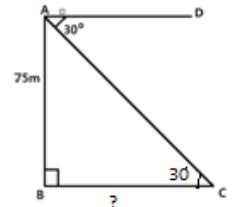
$\dfrac{\sqrt{3}}{2}=\dfrac{75}{AC} \Rightarrow AC = \dfrac{75X2}{\sqrt{3}} = \dfrac{150}{\sqrt{3}} = \dfrac{150X\sqrt{3}}{\sqrt{3}X\sqrt{3}} = \dfrac{\overset{50}{\cancel{150}X\sqrt{3}}}{\cancel{3}} = 50\sqrt{3}$

233. b) $75\sqrt{3}$ m ($\angle C= 30^0$(Alternate angle)

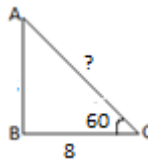$\tan30^0=\dfrac{Opp.side}{Adj.side}=\dfrac{AB}{BC}=\dfrac{75}{BC}$

$\dfrac{1}{\sqrt{3}}=\dfrac{75}{BC} \Rightarrow BC= 75\sqrt{3}$

234. d) 16m (Cos $60^0 = \dfrac{Adj.side}{Hypo}=\dfrac{BC}{AC}$

$\dfrac{1}{2}=\dfrac{8}{AC} \Rightarrow AC= 8x2=16m$)

235. a) 30^0 ($\tan\theta=\dfrac{Opp.side}{Adj.side}=\dfrac{10}{10\sqrt{3}}=\dfrac{1}{\sqrt{3}}$

$\Rightarrow \theta = 30^0$)

236. a) $50\sqrt{3}$ m($\tan30^0 = \dfrac{Opp.side}{Adj.side}=\dfrac{AB}{BC}=\dfrac{50}{BC}$

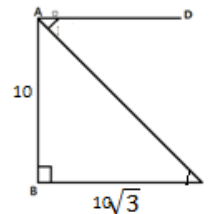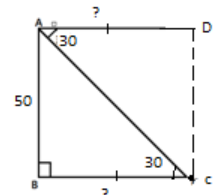$\dfrac{1}{\sqrt{3}}=\dfrac{50}{BC} \Rightarrow BC= 50\sqrt{3}$)

Unit 10: Statistics

237. b) 3Median =Mode +2Mean

238. c) 15   (Ascending order: <u>3,5</u>,**14,16**, <u>19, 20)</u>

(Middle number of 14 and 16 is Median)

Median $=\frac{14+16}{2}=\frac{30}{2}=15$)

239. b) 17.5 (Mid point$= \frac{10+25}{2} =\frac{35}{2} =17.5$)

240. d) 3(Mean$= \frac{1+2+3+4+5}{5} =\frac{15}{5} = 3$)

241. b) 20(10 has highest frequency)

242. a) 20 (Mean $\bar{X} = \frac{\sum f_i x_i}{\sum f_i} = \frac{400}{20} =20$)

243. b) 15 (Ascendin order: <u>12, 14</u>, **15,**<u>17, 19</u>, Middle number is median)

244. b) 5.6(Mean$= \frac{\text{Sum of first five prime numbers}}{5} = \frac{2+3+5+7+11}{5} =\frac{28}{5} =5.6$)

245. d) 13 (Mode= 3median– 2Mean

Mode= 3(15) – 2(16) = 45-32 =13)

246. c)   1 (Most frequent(3 times) repitition)

247. a) 30 (Median is the x coordinate of the intersection point of graph)

248. c) Mode

249. b)   35 (Mean $=\frac{50+20}{2} =\frac{70}{2} =35$)

250. d)   Range

251. c) 1 (Mean $=10 = \frac{11+8+9+12+x}{5}$

10x5 = 40+x

$\Rightarrow$ 50= 40+x $\Rightarrow$ x = 50-40 =10

252. c) More frequent repeat value

253. b) 15 (x=15:repeating 3times.16 or 17 could have been, but had no options)

254. c) 20 (Mode= 3Median– 2Mean)

12= 3(Median) – 2(24)

12 = 3(Median) -48

12 + 48 = 3(Median)

60 = 3(Median) $\Rightarrow$Median $= \frac{60}{3} = 20$

255. b) 5   (Mean$= \frac{1+3+5+7+9}{5} =\frac{25}{5} = 5$)

256. a) 10

257. c) $1 + \left|\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right| h$

258. b) (30-40)(This class interval has maximum frequency(30))

259. d) x > 8(The class interval which has maximum frequency is modal class)

260. a) 15(Modal class is 20-25. It has maximum frequency)

261. b) (30-40)($\dfrac{n}{2} = \dfrac{60}{2}$ = Class interval which has 30thvalue)

262. a) $1 + \left[\dfrac{\frac{n}{2} - C_f}{f}\right] h$

263. b) 50(Modal class is 50-60.Its lower limit l=50)

264. c) 55 (Mean $=42 = \dfrac{27+30+45+60+35+x}{6}$

   42x6 = 197+x

   $\Rightarrow$252=197+x $\Rightarrow$ x = 252-197 =55

Unit 11 : Surface area and Volumes

265. d) $100m^3$ (Volume of cone $= \frac{1}{3}$ Volume of Cylinder $= \frac{1}{3}$ X 300 =100)

266. c) $616cm^2$ (Surface area of $= 4\pi r^2$

$$= 4 \times \frac{22}{7} \times 7 \times 7 = 4 \times 22 \times 7 = 616$$

267. c) $\pi(r_1 + r_2)l$

268. b) $2\pi r(r+h)$

269. c) $\frac{4}{3}\pi r^3$

270. a) $l^2 = h^2 + r^2$

271. c) $\sqrt{h^2 + r^2}$

272. a) 36 cm^2 (Volume of Cube $a^3 = 27 \Rightarrow a = 3$

$\therefore$ Lateral Surface Area of Cube $= 4a^2 = 4 \times 3 \times 3 = 36$)

273. b) $\frac{4}{3}\pi r^3 = \frac{1}{3}\pi R^2 h$

274. d) 192 cm^2 (Curved Surface Area of Cylinder $= 2\pi rh = \underline{24}$ x8 = 192)

275. c) 6cm ($12 \times 6 \times 3 = 216 = a^3 \Rightarrow a = \sqrt[3]{216} = 6$)

276. c) $\frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1 r_2)$

277. c) 220cm^2 (Curved Surface Area of Cone $= \pi rl$

$$= \frac{22}{7} \times 7 \times 10 = 220)$$

278. b) $\frac{4}{3}\pi R^3 = \pi r^2 h$

279. b) 15cm (Volume of Cone = Volume of Cylinder)

$$\frac{1}{3} \pi r^2 h_1 = \pi r^2 h_2 \quad \text{(radii are equal)}$$

$$\frac{1}{3} \times h_1 = 5 \Rightarrow h_1 = 15$$

280. b) $4:3$

$$\frac{4}{3}\pi R^3 : \frac{4}{3}\pi r^3 = 64:27$$

$$R^3 : r^3 = 64:27$$

$$R : r = \sqrt[3]{64} : \sqrt[3]{27} = 4:3$$

281. b) 2r Units   (Volume of Cone = Volume of Cylinder)

    i. $\frac{1}{3}\pi R^2 h = \frac{4}{3}\pi r^3$ (h=r)

    ii. $\frac{1}{3}\pi R^2 r = \frac{4}{3}\pi r^3$ (Cancellation of $\frac{1}{3}\pi$ and r of LHS and RHS)

    iii. $\frac{1}{3}\pi R^2 = \frac{4}{3}\pi r^2$

    iv. $R^2 = 4r^2 \Rightarrow r = \sqrt{4r^2} = 2r$

282. b) $3\pi r^2$
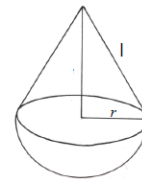
283. b) Cone and Cylinder

284. c) $2\pi r^2 + \pi rl$ (Total Surface Area of Toy

    v. =LSA of Hemisphere + LSA of Cone)

285. c) 16:25

$$\frac{4\pi r^2}{} : \frac{4\pi R^2}{}$$

$$r^2 : R^2 = 4^2 : 5^2 = 16:25$$

286. b) Frustum of Cone And Cylinder

287. b) 3:2

$$\frac{4}{3}\pi R^3 : \frac{4}{3}\pi r^3 = 27:8$$

$$R^3 : r^3 = 27:8$$

$$R:r = \sqrt[3]{27} : \sqrt[3]{8} = 3:2$$

288. b) $\frac{1}{3}\pi H(R^2 + r^2 + Rr) + \pi r^2 h$

289. d) 8(No. of balls= $\dfrac{\text{Volume of } 4cm\, radius}{\text{Volume of } 2cm\ radius}$

$$= \frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3} = \frac{R^3}{r^3} = \frac{4^3}{2^3} = \frac{64}{8} = 8)$$

290. b) 2 Hemispheres + Cylinder

291. a) $2 \times 2\pi r^2 + 2\pi rh$

292. b) $\pi r(r+l)$

293. b) $\frac{2}{3}\pi r^3$

294. a) $\frac{2}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$

295. c) 90 Cubic units

296. d) $77 cm^2$ ($4\pi r^2 = 154 \Rightarrow 2\pi r^2 = \dfrac{154}{2} = 77$)

297. d) 308 cm² ($2\pi r^2 = 2 \times \frac{22}{7} \times 7 \times 7 = 308$)

298. c) 462 cm² ($3\pi r^2 = 3 \times \frac{22}{7} \times 7 \times 7 = 462$)

299. d) 440 cm²   ($2\pi rh = 2 \times \frac{22}{7} \times 7 \times 10 = 440$)

300. b) $2\pi rh$ (Pipe means lateral surface area)

301. c) 1960π cm³ ($2\pi r = 88$

$$\Rightarrow 2 \times \frac{22}{7} \times r = 88 \quad \Rightarrow r = \frac{88 \times 7}{2 \times 22} = 14$$

$\therefore$ Volume $= \pi r^2 h = \pi \times 14 \times 14 \times 10 = 1960\pi$

302. b) 35π cm² ($2\pi r = 22 \Rightarrow 2 \times \frac{22}{7} \times r = 22 \Rightarrow r = \frac{7}{2}$ | $2\pi rxh = 22 \times 5 = 110$

vi. $2\pi rh = 2 \times \pi \times \frac{7}{2} \times 5 = 35\pi$ | $110 \times \frac{\pi}{\pi} = 110 \times \pi \times \frac{7}{22} = 35\pi$

303. b) $\pi(r_1 + r_2)l + \pi r_1^2 + \pi r_2^2$ (lateral surface area of frustum of cone)