SIMILAR TRIANGLES

IMPORTANT FACTS AND FORMULAS

1. Two triangles are said to be similar if
   a) Their corresponding angles are equal.
   b) Their corresponding sides are proportional

2. Criterion of similarity : Δ ABC and Δ DEF are similar triangles. If any one of these
   a) $\angle A = \angle D$, $\angle B = \angle E$, $\angle C = \angle E$
   (A.A Similarity)

   b) $\dfrac{AB}{DE} = \dfrac{AC}{DF}$ and $\angle A = \angle D$
   (SAS Similarity)

   c) $\dfrac{AB}{DE} = \dfrac{AC}{DF} = \dfrac{AC}{EF}$
   (SSS similarity)

3. In similar Δs, the ratio of corresponding sides is equal to the ratio of their perimeter i.e. in $\Delta ABC \sim \Delta DEF$

   $$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{AF} = \frac{AB + BC + AC}{DE + EF + AF}$$

   Congruent triangles are necessarily similar but similar triangles may not be congruent.
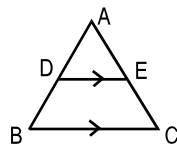
   If ABC is a triangle, right angled at B and $BD \perp AC$ then
   a) Δ ADB $\sim$ Δ ABC
   b) Δ BDC $\sim$ Δ ABC
   c) Δ ADB $\sim$ Δ BDC

4. If a line is a drawn parallel to one side of triangle, intersecting the other two sides, then it divides these sides in the same ratio.
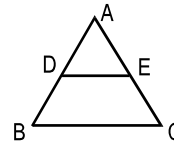
   In Δ ABC, DE || BC

   then $\dfrac{AD}{DB} = \dfrac{AE}{EC}$

5. If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

   In Δ ABC, if $\dfrac{AD}{DB} = \dfrac{AE}{EC}$ then DE || BC

6. If in two triangles, corresponding angles are equal , then their corresponding sides are in the same ratio and hence the two triangles are similar.

7. If in two triangles, sides of one triangle are proportional to the sides of other triangle, then their corresponding angles are equal and hence two triangles are similar (SSS criteria of similarity).

   In Δ ABC and DEF

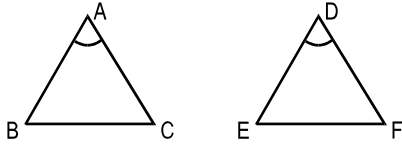   if $\dfrac{AB}{DE} = \dfrac{BC}{EF} = \dfrac{AC}{DF}$ then Δ ABC is ΔDEF
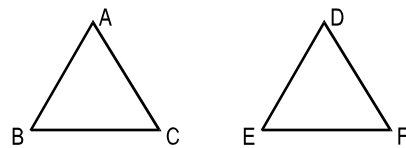
8. If one angle of a triangle is equal to one angle of other triangle and sides including these angles are proportional, then the two triangles are similar (SAS Criteria).

   In Δ ABC and DEF

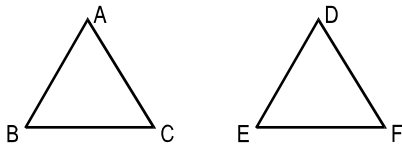   if $\angle A = \angle D$ and $\dfrac{AB}{DE} = \dfrac{AC}{DF}$

   then Δ ABC $\sim$ ΔDEF

9. The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

If Δ ABC ~ DEF then

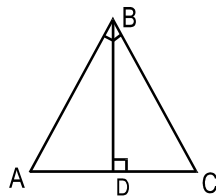$$\frac{area(\Delta ABC)}{area(\Delta DEF)} = \frac{AB^2}{DE^2} = \frac{BC^2}{EF^2} = \frac{AC^2}{DF^2}$$

10. If a perpendicular is drawn from the vertex of the right angle triangle then both triangles on both sides of the perpendicular are similar to the whole triangle and to each other.

If ABC is a rt $\angle$d triangle having right angle at B and BD $\perp$ AC, then

i) ΔADB ~ ΔABC

ii) ΔBDC ~ ΔABC

iii) ΔADB ~ ΔBDC


1 Δ ABC is an isosceles triangle with AC = BC and if $AB^2 = 2AC^2$ then
a) Δ ABC is right angle triangle
b) Δ ABC is equilateral triangle
c) BC = AB
d) None of these

2. All ………… triangles are similar
a) Isosceles
b) Equilateral
c) Right angle
d) None of these

3. Two polygons of the same number of sides are similar if
a) Their corresponding angles are equal
b) Their corresponding sides are proportional
c) Both a and b are true
d) None of these

4. Two figures are said to be similar if and only if
a) They have same shape
b) If they have same size
c) Only a) is true not necessarily b)
d) None of these

5. All circles are …………….
a) Congruent   b) Similar
c) Both a and b   d) None of these

6. All squares are
a) Congruent   b) Similar
c) Both a and b   d) None of these

7. ABCD is a trapezium in which AB‖ DC and its diagonals interdect each other at the point. Then which of the following is true.

a) $\dfrac{AO}{BO} = \dfrac{CO}{BO}$ b) $\dfrac{AO}{DO} = \dfrac{CO}{BO}$

c) $\dfrac{AO}{BO} = \dfrac{CO}{DO}$ d) $\dfrac{DO}{AO} = \dfrac{BO}{CO}$

Q8. In ABC , $\angle$A = 90° , If AD $\perp$ BC , then $AB^2 + CD^2$ =
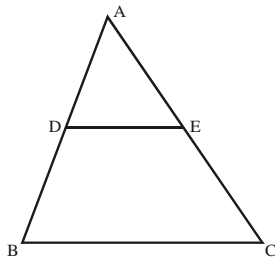a) AC + BD   b) $CD^2 + AD^2$
c) CD + AD   d) $AC^2 + BD^2$

9. In fig △ABC , DE ∥ BC. If AD = 12cm, DB = 8cm, AE = 9cm then CE = ?
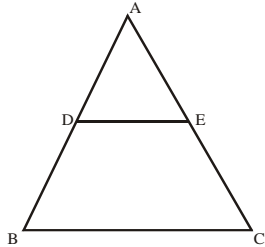
a) 4   b) 6
c) 9   d) 16

10. In fig a triangle ABC , DE ∥ BC . If DE = 4 cm, BC = 8cm and area (△ ADE) = 25 sq. cm. Then area of the △ ABC is = ?

a) 6.25 sq.cm
b) 12.5 sq.cm
c) 50 sq.cm   d) 100 sq.cm

11. △ ABC ~ △ PQR. If the perimeter of △ ABC = 36 cm and perimeter of △ PQR = 24cm. If PQ = 10cm then AB = ?
a) 0.6   b) 6.6
c) 15   d) 22.5

12. The ratio of the corresponding sides of two similar D's is 1:3, the ratio of their corresponding heights is
a) 1:3   b) 3:1
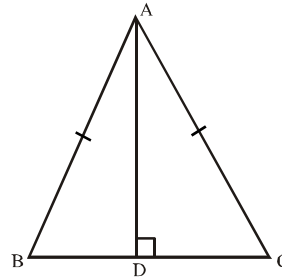c) 1:9   d) 9:1

13. In △ABC ∠B=105°, ∠C=50° find ∠A
a) 55°   b) 50°
c) 20°   d) 25°

14. In an isoscles triangle ABC, if AB =AC = 13cm and the atitude from A and BC is 5cm; find BC
a) 12cm   b) 24cm
c) 32cm   d) 16cm

15. In an equilateral triangle with side 2a. the length of an altitude is (in figure)

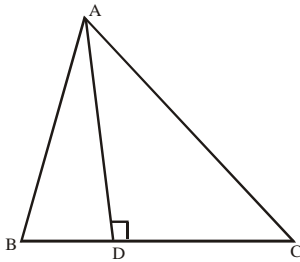a) $\sqrt{3}a$ b) $3\sqrt{a}$
c) 3a   d) $\sqrt{3a}$
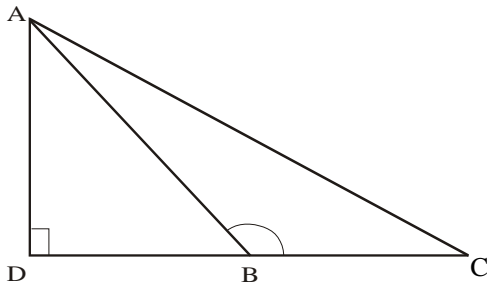
16. In fig △ ABC ~ △ CED , the value of x is
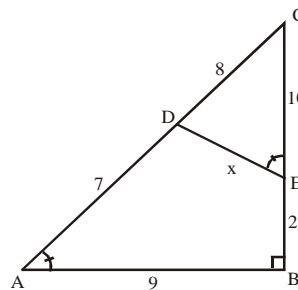
a) 50/3   b) 3
c) 6   d) 13.5

17. In fig ∠B of △ ABC is an acute angle and AD⊥BC which one of the following is correct.
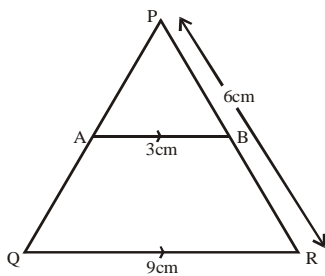a) $AC^2 = AB^2 + BC^2 - 2BC.BD$
b) $AC^2 = AB^2 + BC^2 - 2BC.BD$
c) $AC^2 = AB^2 + BC^2 - 2BD.DC$
d) $AC^2 = AB^2 + BC^2 - 2BD.DC$

a) 216   b) 64
c) 192   d) 288

18. ∠B of Δ ABC is an obtuse angle and AD ⊥ when CB produced. Which one of the following in correct. (in figure)

 a) $AC^2 = AB^2 + BC^2 - 2BC.BD$
 b) $AC^2 = AB^2 + BC^2 - 2BC.BD$
 c) $AC^2 = AB^2 + BC^2 - 2BD.DC$
 d) $AC^2 = AB^2 + BC^2 - 2BD.DC$

19. In figure, AB∥ QR. The value of PB is

 a) 2cm   b) 3cm
 c) 4.5cm   d) 9cm

20. Corresponding sides of two similar triangles are in the ratio 3:2. if the area of the smaller triangle is 96 cm² . the area of larger triangle will be.

21. The three altitudes of a triangle are equal, then the triangle is
 a) equilateral b) Isosclas
 c) right angles d) obtuse angled

22. If the angles of a triangle are in the ratio 2:3:4 then 3 angles are
 a) 20°,40°,60° b) 40°,80°,60°
 c) 40°,60°,80° d) 20°,80°,100°

23. In an isosceles right angled triangle, the length of the hypotenuse is 8cm. the perimeter of the triangle in cm is
 a) 8(2+1)   b) 16
 c) 7 : 8   d) 16 : 2

24. The measure of the sides of the triangle are x, 3x and 2x. the measure of the angle opposite to the side x in degree is
 a) 30°   b) 45°
 c) 60°   d) 90°

25. Which of the following is not the criteria for two triangles to be similar?
 a) S.S.S.   b) A.A.A.
 c) S.A.S.   d) R.H.S.

26. In figure altitude is drawn to the hypotenuse of a right triangle. The value of y in cm is
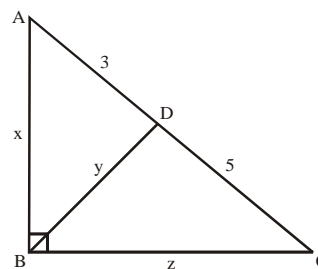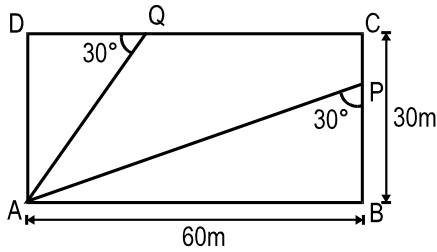

 a) 3   b) 5
 c) $\sqrt{15}$ d) $\sqrt{34}$

27. In an Isoscales triangle, vertical angle is 36°
    then greatest angle in the D is
    a) 144°   b) 90°
    c) 108°   d) 72°

28. In fig, the rentangle ABCD, AP+AQ = ?

    a) 160m   b) 180m
    c) 135m   d) 210m

29. If all the 3 angles of a triangles are equal
    then each one of them is =
    a) 90°   b) 45°
    c) 60°   d) 30°

30. Two isosceles triangles have equal vertical
    angles and the ratio of their areas are 25:36,
    their heights are in the ratio
    a) 6:5   b) 5 : 6
    c) 25 : 36   d) 625 : 1296

31. △ ABC is similar to △ DEF

    $\dfrac{\text{Area of } \triangle ABC}{\text{Area of } \triangle DEF} = \dfrac{144}{169}$ then $\dfrac{AB}{DE} = ?$

    (a) $\dfrac{144}{169}$ (b) $\dfrac{12}{13}$

    (c) $\dfrac{169}{144}$ (d) $\dfrac{13}{12}$

32. In the given figure   DE ‖ BC such that
    DE divides △ ABC into two parts equal in
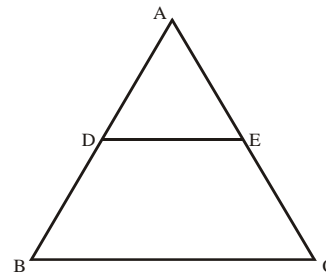
    area the value of $\dfrac{AE}{AC}$ is

a) $\dfrac{1}{2}$ b) $\dfrac{1}{\sqrt{2}}$

c) $\dfrac{\sqrt{2}-1}{\sqrt{2}}$ d) $\dfrac{\sqrt{2}+1}{\sqrt{2}}$

In the figure DE‖ BC in the △ABC ,
Answer the question 33 to 38

33. If AC = 10cm , AB = 15cm, AE = 2cm then
    CE is = ?
    a) 2 cm   b) 5 cm
    c) 7.5 cm   d) 8 cm

34. If AB = 12 cm , AC = 10cm , AD = 3cm
    then CE = ?
    a) 3 cm   b) 2.5 cm
    c) 2.7 cm   d) 7.5 cm

35. If AD = 3 cm , BD = 5cm , AE = 6cm then
    CE = ?
    a) 2.5 cm   b) 3.5 cm
    c) 9 cm   d) 10 cm

36. If AB = 12cm, AC = 10cm, AD = 3cm then
    AE = ?
    a) 3.5 cm   b) 2.5 cm
    c) 9 cm   d) 16 cm

37. If AD = 3cm, BD = 5cm, AE = 6cm then
    AC = ?
    a) 3.5 cm   b) 5 cm
    c) 9 cm   d) 16 cm

38. If $\dfrac{AE}{EC} = \dfrac{5}{4}$ and AD = 2cm then AB = ?

a) 1.6 cm   b) 3.6 cm

c) 4 cm   d) 5 cm

Figure for Question No. 39 to 42.

In the figure ST || QR in Δ PQR, question number 39 to 42
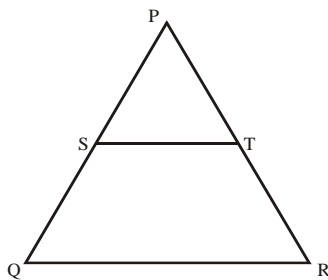
39. The ratio of $\dfrac{PQ}{PS}$ is

a) $\dfrac{PT}{TR}$ b) $\dfrac{RT}{PT}$

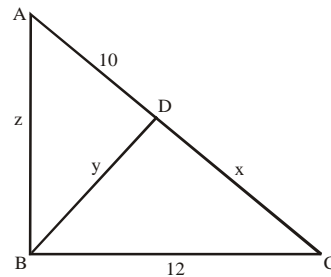c) $\dfrac{PR}{TR}$ d) $\dfrac{PR}{PT}$

40. The ratio of $\dfrac{PS}{PQ}$ is

a) $\dfrac{PT}{PR}$ b) $\dfrac{RT}{PT}$

c) $\dfrac{PR}{PT}$ d) $\dfrac{PR}{TR}$

41. The ratio of $\dfrac{PS}{SQ}$ is

a) $\dfrac{PT}{TR}$ b) $\dfrac{RT}{PT}$

c) $\dfrac{PR}{PT}$ d) $\dfrac{PR}{TR}$

42. The ratio of $\dfrac{PT}{TR}$ is

a) $\dfrac{PS}{SQ}$ b) $\dfrac{PS}{PQ}$

c) $\dfrac{QS}{PQ}$ d) $\dfrac{SQ}{PS}$

43. In the figure attitude is drawn to the hypotenuse of a right angled triangle. The value of y in cm is

a) $\sqrt{244}$ b) $6\sqrt{5}$

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

44. If D and E divides the side AB and AC of Δ ABC in the ratio 1: 1 then ratio of areas of triangle ADE and ABC is

a) 2 : 3   b) 1 : 4

c) 1 : 2   d) 4 : 3

45. A vertical rod 12 cm long casts a shadow 8 cm long on the ground. At the same time, a Tower casts a shadow 40 cm long on the ground. The height of Tower is

a) 40m   b) 20m

c) 52m   d) 60m

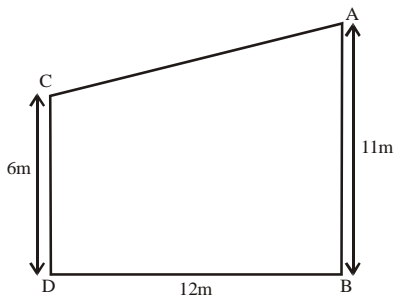46. The sides of a triangles are 11m, 60m, 61m. the altitude to the smallest side is

a) 11m   b) 66m

c) 50m   d) 60m

47. $\triangle ABC$ and $\triangle BDE$ are two equilateral triangles such that D is mid point of BC. Ratio of the areas of triangles ABC and BDE is
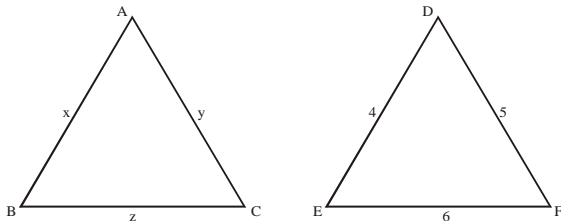   a) 2:1   b) 1:2
   c) 4:1   d) 1:4

48. In figure the length of AC is

   a) 12m   b) 11m
   c) 13m   d) 6m

Figure for question No. 49 to 51

49. In $\triangle ABC \sim \triangle DEF$ perimeter of $\triangle ABC = 30$ cm^2. find x
   a) 8   b) 4
   c) 16   d) 5
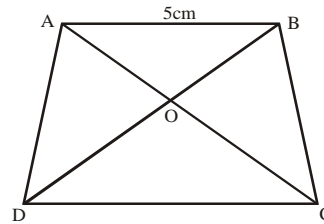
50. The value of y is
   a) 10   b) 8
   c) 6   d) 5
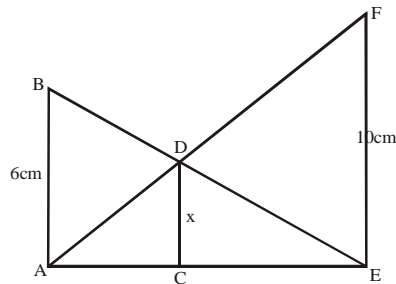
51. The value of z is
   a) 10   b) 6
   c) 5   d) 12

52. In figure
$$\frac{AO}{OC} = \frac{BO}{OD} = \frac{1}{2}, AB = 5cm \text{ the value of}$$

   a) 5 cm   b) 2 cm
   c) 2.5 cm   d) 10 cm

53. In the figure, AB∥ CD∥ EF. If AB = 6cm, CD = xcm, EF = 10cm, then value of x is

   a) 15/4 cm   b) 4cm
   c) 8cm   d) 5cm

54. There is a stair case as shown in the figure, connecting points A and B. measurements of steps are marked in the figure 68. the straight line distance between A and B is
   a) $6\sqrt{5}$ b) $4\sqrt{5}$
   c) 8   d) 10

55. The sides of the triangle ABC are 6cm, 8cm and 10cm. The length of median to the side of length 8 cm is
   a) 4cm   b) $2\sqrt{13}$ cm
   c) $\sqrt{73}$ cm   d) 5 cm

56. PQRS is a trapezium having PQ ∥ SR. 'O' is the point of intersection of diagonals divides the two diagonals in the same ratio, if PQ = 3SR the ratio of $\dfrac{\text{area of } \Delta OSR}{\text{area of OPQ}}$ is

a) 1 : 3   b) 3 : 1
c) 1 : 9   d) 9 : 1

57. If the area of an isocelss right triangle is 8cm. The perimeter of triangle are

a) $8 + \sqrt{2}$ cm²   b) $8 + 4\sqrt{2}$ cm²

c) $4 + 8\sqrt{2}$ cm²

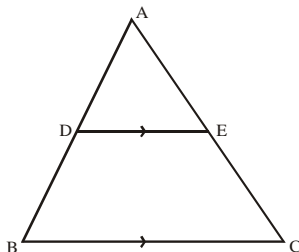d) $12\sqrt{2}$ cm²

Figure for questions No. 58 and 59

58. In the *figure 62* DE∥BC and $\dfrac{AD}{DB} = \dfrac{2}{3}$

then $\dfrac{\text{area } (\Delta ADE)}{\text{area } (\Delta ABC)}$

a) $\dfrac{2}{3}$ b) $\dfrac{4}{9}$

c) $\dfrac{4}{25}$ d) $\dfrac{25}{4}$

59. In the *figure* DE∥BC and $\dfrac{AD}{DB} = \dfrac{2}{3}$ then

$\dfrac{\text{area (Trapezium DECB)}}{\text{area } (\Delta ABC)} =$

a) 2/3   b) 2/5

c) $\dfrac{4}{5}$ d) $\dfrac{21}{25}$

60. ABCD is a square. F is the mid point of AB. BE is one third of BC. If the area of ΔFBE = 108cm², find the length of AC.

a) 52cm   b) 50.94cm
c) 50.16cm   d) 56cm

61. In Δ ABC AB = BC = CA = 2a and AD ⊥ BC, then the area of ΔABC is

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

c) $\sqrt{3}a^2$ d) $3a^2$

62. The base and hypotenuse of a right triangle are respectively 5cm & 13cm long. Its area is

a) 25cm²   b) 28cm²
c) 30cm²   d) 40cm²

63. X, Y and Z are the mid points of the sides PQ, PR and QR respectively of ΔPQR. The

ratio of $\dfrac{\text{ar } (\Delta XYZ)}{\text{ar } (\Delta PQR)}$ is

a) $\dfrac{1}{1}$ b) $\dfrac{1}{2}$
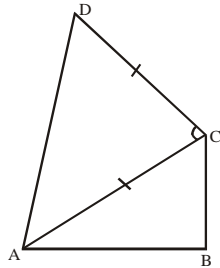
c) $\dfrac{1}{4}$ d) $\dfrac{1}{8}$

64. A ladder 25m long raches a window of a building 20m above the ground. The distance of the foot of the ladder from the building is

a) 15m   b) 541m
c) 5m   d) 25m

65. In figure a quadrilateral ABCD CA = CD ∠B = 90° and AD² = BC² + CA², then ∠ACD is

a) 90°   b) 45°
c) 30°   d) 60°
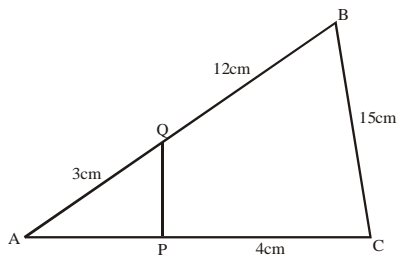
66. In figure ABCD is a square. F is the mid point of AB. BE is one third of BC . The area of the Δ FBE is 108sq.cm. the length of AC is
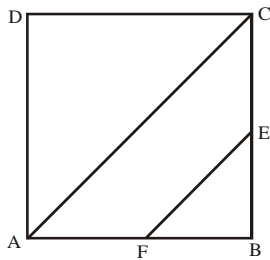
a) 36√2   b) 6√2
c) 36   d) 6

Figure for question 67 to 68

67. Δ APQ ~ Δ ABC and if QP is not parallel to BC and PC = 4cm, AQ=3cm, QB = 12cm and BC = 15cm. the value of AP is

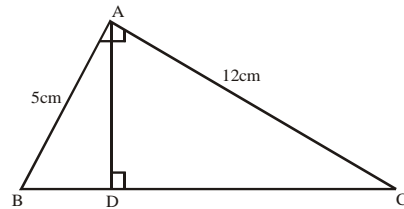a) 5   b) 9
c) 1   d) 4/3

68. Find $\dfrac{\text{area }(\triangle APQ)}{\text{area }(\triangle ABC)}$

a) $\dfrac{1}{9}$ b) $\dfrac{1}{16}$
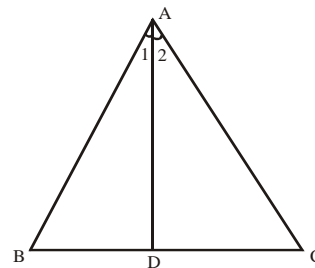
c) $\dfrac{1}{4}$ d) $\dfrac{1}{3}$

69. In figure 75 $\angle BAC = 90^0$, AD⊥BC, AB=5cm, AC=12cm, then $\dfrac{\text{ar }(\triangle ACD)}{\text{ar }(\triangle BCA)}$ is

a) $\dfrac{25}{144}$ b) $\dfrac{144}{169}$

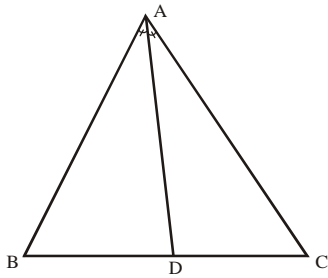c) $\dfrac{25}{169}$ d) $\dfrac{12}{13}$

70. In the figure Δ ABC, $\dfrac{AB}{AC} = \dfrac{BD}{DC}$, $\angle B = 70°$, $\angle C = 50°$. then $\angle BAD$ is

a) 60°   b) 45°
c) 30°   d) 90°

Figure for question no. 71 to 74

71. In Δ ABC, AD is the bisector of ∠A, meeting side BC at D. if BD = 2.5cm, AB = 5cm, AC = 4.2cm . The value of DC is

a) 2.1 cm   b) 1.2 cm
c) 4.2 cm   d) 2.5 cm

72. If BD = 2cm, AB =5cm, CD = 3cm, the value of AC is
a) 3.1 cm   b) 7.5 cm
c) 2 cm   d) 3 cm
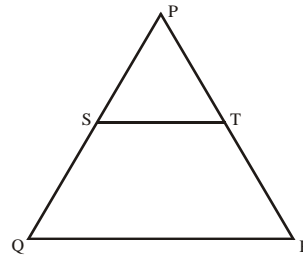
73. If AB = 10cm, AC = 4cm, BC = 6cm, the value of BD is

a) 8.4 cm   b) 3.5 cm
c) 2.5 cm   d) 14 cm

74. If AC = 4.2cm, DC = 6cm, BC = 10cm, the value of AB is
a) 2.8 cm   b) 6.3 cm
c) 4.1 cm   d) 6 cm

75. In the figure, the Δ PQR, ST∥QR with S on PQ and T on PR. If $\dfrac{PS}{SQ} = \dfrac{2}{3}$, then find $\dfrac{QR}{ST}$

a) 2/3   b) 3/2
c) 5/2   d) 52/5

KEY (Similar Triangles)

1	a	16	c	31	b	46	d	61	c
2	b	17	a	32	b	47	c	62	c
3	c	18	c	33	d	48	c	63	c
4	c	19	a	34	d	49	a	64	a
5	b	20	a	35	d	50	a	65	a
6	b	21	a	36	b	51	d	66	a
7	c	22	c	37	d	52	d	67	a
8	d	23	a	38	b	53	a	68	a
9	b	24	a	39	d	54	d	69	b
10	d	25	d	40	a	55	b	70	c
11	c	26	c	41	a	56	c	71	a
12	a	27	d	42	a	57	b	72	b
13	d	28	b	43	c	58	c	73	c
14	b	29	c	44	b	59	d	74	a
15	a	30	b	45	d	60	b	75	c

Circle

Important facts and formula

A circle is the locus of a point which moves in a plane in such a way that its distance from a given fixed point in the plane is always constant. The constant distance is called radius (r) of circle and fixed point is called **centre of circle.**

Circles having same centre but different radius are called **concentric circles.**

A continuous piece of a circle is called **arc of circle**.

A line segment, joining any two points on a circle is called a **chord of circle**. A chord passing through the centre of circle is called **diameter**.

Two circles are congrument, if and only if their radius are equal and two circles are said to be congrument, if and only if they have same degree measures.

If a line PQ and the circle have two common points A and B, then this line is called secant of circle. If there is only one point common to line PQ and the circle, then this line is called **tangent of circle.**

Note: The length of two tangents drawn from the external point to a circle are equal.

i)   If PAB is a secant to a circle at A and B and PT is a tangent segment, then PA × PB=PT^2.

ii) The tangent at any point of a circle is perpendicular to the radius through the point of contact.

a   Tangent lines at the end points of a diameter of a circle are parallel.

b   If two tangents are drawn to circle from an external point, then

i)   they subtend equal angles at the centre

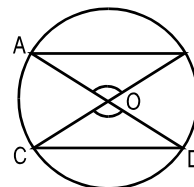ii) they are equally inclined to the segment, joining the centre to that point
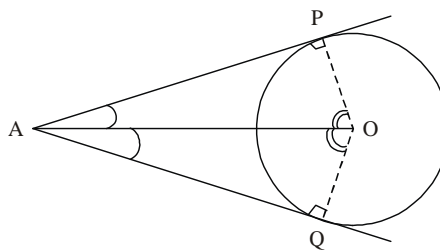
iii) No tangent can be drawn to a circle from a point lying inside it.

If a side of a cyclic quadrilateral is produced, then the exterior angle thus formed is equal to interior opposite angle
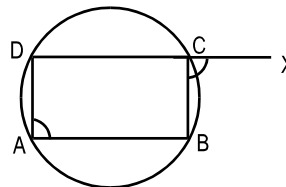
Ex. ∠BCX = ∠BAD

Equal chords (or equal arcs) substend equal angles at the centre.

If AB = CD
then ∠AOB = ∠COD

1. A line intersecting a circle in two points is called.
   a) Tangent
   b) Secant
   c) Chord
   d) Radius

2. Number of parallel tangents a circle may have ?
   a) 4
   b) 3
   c) 2
   d) 1

3. From a point Q, the length of the tangent to a circle is 24m and the distance of Q from the centre is 25cm. The radius of circle is
   a) 7cm
   b) 12cm
   c) 15cm
   d) 24cm

4. A point P is 13 cm from the centre of the circle. The length of the tangent drawn from P to the circle. The length of the tangent drawn from P to the circle is 12cm. then the radius of the circle.
   a) 5cm
   b) 7 cm
   c) 9 cm
   d) 6 cm

5. How many tangents can a circle have?
   a) 1
   b) 2
   c) 10
   d) Infinite

6. Two concentric circles are of radii 5cm and 3cm. then length of the chord of the larger circle, which touches the smaller circle
   a) 10cm
   b) 8cm
   c) 12cm
   d) 14cm

7. The parallelogram, circumscribing a circle is
   a) A square
   b) A rectangle
   c) A rhombus
   d) None of these

8. PAB is a secant to a circle intersecting it at A and B and PT is a tangent to the circle then
   a) PA x PB = PT
   b) PA x PT= PB
   c) PB x PT = PA
   d) PA x PB = PT²

9. If PA and PB are two tangents drawn from an external point to a circle then
   a) PA x PB = 1
   b) PA= PB
   c) PA + PB = 1
   d) PA + PB = 0

10. A circle of radius 5 cm have two chards of AB = 6cm and BC = 8cm. Then the distance between AB and CD will be
    a) 10cm
    b) 2cm
    c) 9 cm
    d) 7cm

11. One and only one circle can be drawn through
    a) Any two points
    b) Any three points
    c) Only one points
    d) Three – non Collinear Points

12. An cyclic parallegram is called
    a) Rhombus
    b) Rectangle
    c) Square
    d) Parallelogram

13. A circle and a square has same perimeter then
    a) The area of the square is π² times the area of circle.
    b) The area of the square is π times the area of circle.
    c) The area of circle is more.
    d) Their areas are equal

14. Angle subtended by major arc in the alternate segment of the circle is always.
    a) acute angle
    b) obtuse angle
    c) right angle
    d) straight angle

15. Angle subtended by minor arc in the alternate segment of the circle is always
    a) Straight angle
   b) Acute angle
    c) Right angle
    d) obtuse angle

16. If two circles intersects in two different points, the line joining the centre
    a) Is right bisector of the common chord.
    b) Perpendicular to the common chord
    c) Parallel to the common chord
    d) None of these

17. Two circles of radii 10cm and 17cm intersect at A and B having centers O and Q. if segment AB is 8cm the OQ is
    a) 9cm   b) 20cm
    c) 22cm   d) 121cm

18. Two chords of length 10cm and 24cm are on opposite sides of the centre of a circle of radius 13cm. then distance between the two chords will be
    a) 10 cm   b) 16 cm
    c) 17 cm   d) 18 cm

19. A chord is of length 24cm is drawn in a circle of radius 13cm. its distance from the centre is
    a) 10 cm   b) 5 cm
    c) 151 cm   d) 20 cm

20. If two diameters of a circle intersect each other at right angles, then the quadrilateral formed by joining their end points is a
    a) Square   b) Rectangle
    c) Rhombus   d) Parallelogram

21. Any straight line cannot cut the circle on more than
    a) 1 point   b) 2 points
    c) 4 points   d) 10 points

22. In a circle with centre O, AB and CD are two diameters perpendicular to each other, then the length of chord AC is
    a) 2AB   b) √2AB
    c) 1/2 AB   d) 1/√2 AB

23. In the figure the value of x is equal to
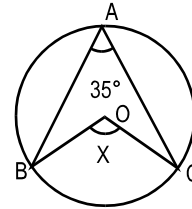
    a) 35°   b) 145°
    c) 70°   d) None of these

24. In the figure is ∠B = 110°, then ∠D will be
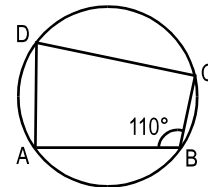
    a) 110°   b) 70°
    c) 30°   d) 80°

25. The tangent drawn at the ends of a diameter of circle are
    a) Perpendicular to each other
    b) Intersect each other
    c) Parallel to each other
    d) None of these

26. A chord is drawn at a distance of 8cm from the center of radius 10cm. then the length of the chord is
    a) 6cm   b) 12cm
    c) 18 cm   d) $2\sqrt{42}$ cm

27. A chord of length 24 cm is drawn in a circle of radius 13 cm. its distance from center is
    a) 5cm   b) 11cm
    c) 12 cm   d) 25cm

28. In the fig 3, two parallel chords AB = 10cm and CD are drawn 7cm apart in the circle

of dia = 26cm. Then the length of the chord CD is
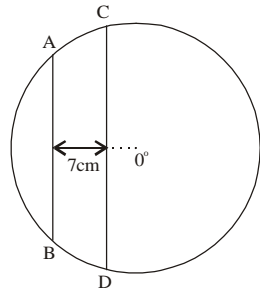
a) 17 cm   b) 14cm

c) $\sqrt{120}$cm   d) 24cm

29. AB and CD are two chords of circle with center 'O'. if AB = 12cm and CD is 10cm then
    a) Chord AB will be nearer to the centre
    b) Chord CD will nearer to the centre
    c) Both will be at the same distance
    d) The distance of chord AB will be twice that of chord CD from the centre.

30. Two parellogram are on the same base and between the same parallels. The ratio of their areas is
    a) 1:2   b) 2:1
    c) 1:1   d) 3:1

31. A circle of radius 5 cm have two chords of AB = 6cm and BC = 8cm as shown in fig 6. The distance between AB and CD will be
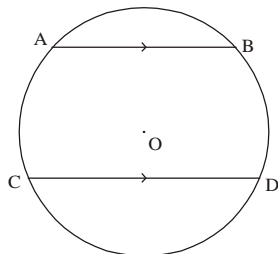
a) 14cm   b) 2cm
c) 10cm   d) 7cm

32. In the figure shown AB = 24 cm, OA = 37 cm and O'A = 20 cm. then OO' will be equal to
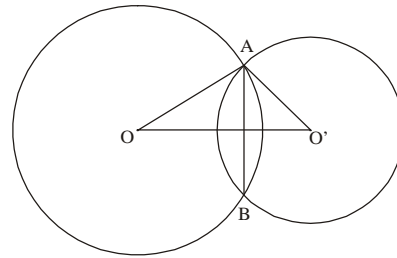
a) 51cm   b) 44cm
c) 36cm   d) 32cm

33. Two chords of length 10 cm and 24 cm are an opposite sides of the center of a circle of radius 13 cm. then distance between the two chords will
    a) 17cm   b) 7cm
    c) 25cm   d) 8cm

34. Two chords of lengths 10 cm and 24 cm are on the same side of the center of a circle of radius 13 cm. the distance them will be
    a) 7cm   b) 17cm
    c) 8cm   d) 25cm

35. If two circles interests in two different points the line joining the center
    a) Is parallel to the common chord
    b) Co-insides with common chord
    c) Is right bisector of common chord
    d) Is only perpendicular to the common chord

36. A line segment joining the centre of the circle to the mid point of the chord is always
    a) Two times the measure of the chord
    b) Half the measure of the chord
    c) Equal to the measure of the chord
    d) Perpendicular to the chord

37. One and only one circle can be drawn through
    a) Any two points
    b) Any three points
    c) Any one point
    d) Three non- collinear points

38. Two circles of radii 10 cm and 17 interest at A and B having centers O and O'. if segment AB is 8 cm then OO' is
    a) 21 cm
    b) 27cm
    c) 7cm
    d) 11 cm

39. A line segment joining any two points on a circle is called
    a) Secant to the circle
    b) Diameter of circle
    c) Radius of a circle
    d) Chord of the circle

40. In the figure, chord AB and CD of a circle with centre when produced meet at E. if AB = CD state
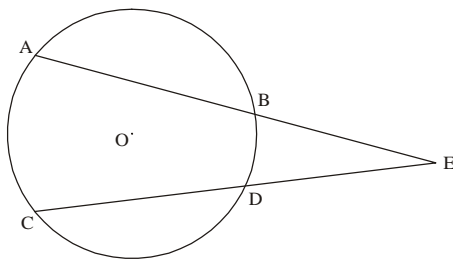
    a) AE = CE
    b) AE>CE
    c) AE<CE
    d) AE= 2 CD

41. In the fig, If AB‖CD then state if
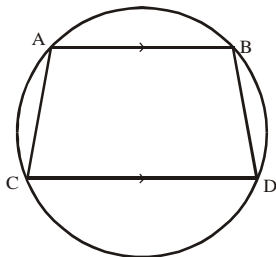
a) AD = BC
b) AD>BC
c) AD < BC
d) AD = $\sqrt{2}$ BC

42. In the figure, O is the mid point of hypotenuse BC of right angled triangle BAC right angled at A. State if
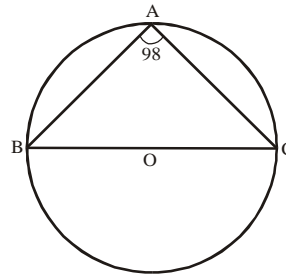
    a) OA = OB = OC
    b) OA = OB ≠ OC
    c) OA ≠ OB = OC
    d) $OB^2 + OC^2 = OA^2$

43. In figure shown if PA = 8 cm, AB = 10cm PC = 9cm. Then CD is equal to
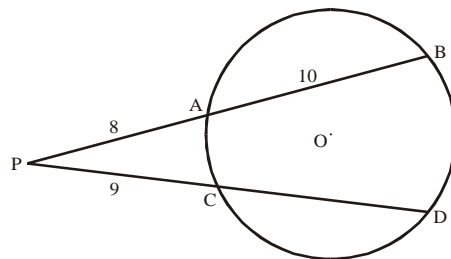
    a) 10cm
    b) 7cm
    c) 90/8 cm
    d) 9cm

44. If a semi circle drawn on one side of a Δ as diameter passes through the opposite vertx then the measure of the triangle is
    a) 30°
    b) 40°
    c) 60°
    d) 90°

45. In the figure, PA and PB are tangents of circle with O as centre ∠APB = 68° the measure of ∠AQB is
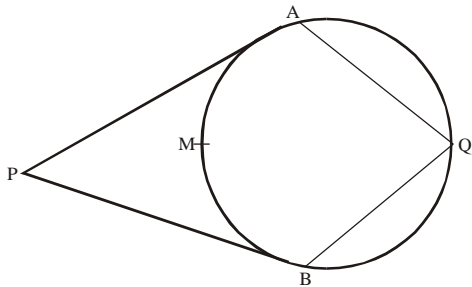
a) 112°   b) 72°
c) 57°   d) 123°

46. A chord of length 14 cm is at a distance of 6 cm from the centre of the a circle. The length of the another chord at a distance of 2 cm from the centre is
a) 12 cm   b) 14 cm
c) 16 cm   d) 18 cm

47. In the figure, Diameter AB = Diameter CD =8 cm intersect 90° at the centre O. then length of chord AC is
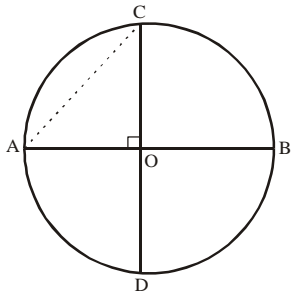
a) 16 cm   b) $8\sqrt{2}$ cm

c) 4 cm   d) $4\sqrt{2}$ cm

48. If two diameters of a circle intersect each other at right angles, then the quadrilateral formed by joining their end points is a
a) Rhombus   b) Rectangle
c) Square   d) Parallelogram

49. A chord of a circle is equal to its radius. The angle subtended by this chord at the centre is

a) 90°   b) 45°
c) 60°   d) 120°

50. In the fig 36 AOC is the diameter of a circle with centre O. If Chord AB is equal to the radius of this circle then ∠ACB is
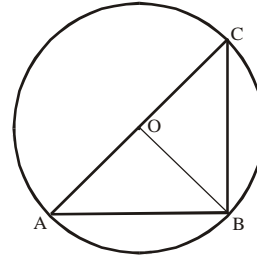
a) 60°   b) 30°
c) 45°   d) 90°

51. In the figure shown the length of the chord AB = radius of the circle. Then the angle APB is equal to
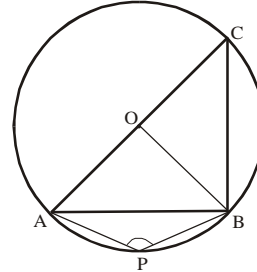
a) 120°   b) 160°
c) 150°   d) 90°

52. In the figure, angle ∠ABC = 45° ∠CAD = 60° Then ∠ACD is equal to
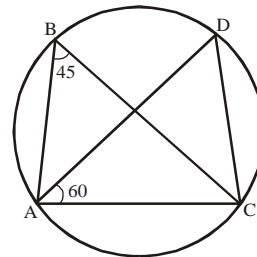
a) 75°   b) 45°
c) 60°   d) 90°

53. In the fig., O is the centre of the circle and ∠AOC = 94° then ∠ABC will be equal to
a) 86°   b) 133°
c) 120°   d) 94°
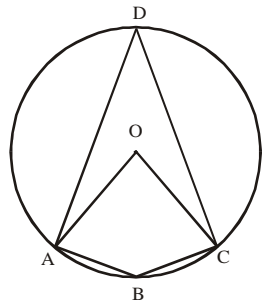
54. In the figure, ∠ABC is an equilateral triangle ∠BPC will be
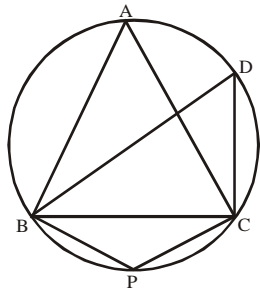
a) 120°   b) 60°
c) 90°   d) 30°

55. In the given figure, O is the centre of a circle ∠ABO = 25° and ACO = 30°. Then ∠BOC is
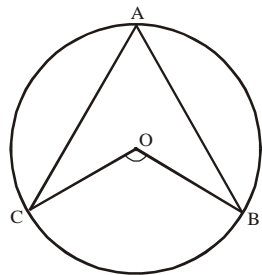
a) 85°   b) 125°
c) 110°   d) 27.5°

56. In the figure, BOC is the diameter of a circle with centre O. AOB = 110° then angle CAO will be equal to
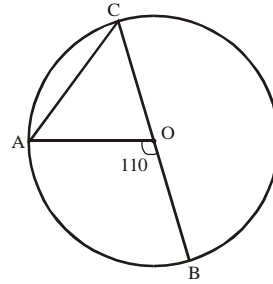
a) 55°   b) 70°
c) 35°   d) 75°

57. In the figure, O is the centre of a circle. If ∠BOC = 100° then ∠BPC will be equal to
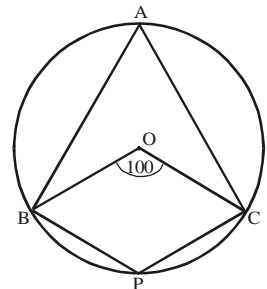
a) 80°   b) 100°
c) 130°   d) 150°

58. In the figure O is the centre of the circle. If ∠PQS = 40° then angle ∠ORQ will be
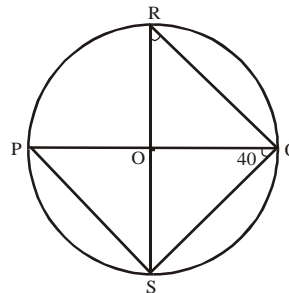
a) 40° b) 50°
c) 100° d) 80°

59. AB and CD are two parallel chords of a circle such that AB = 10 cm and CD = 24 cm. if the chords are on the opposite sides of the centre and distance between them is 17 cm. then the radius of the chord is
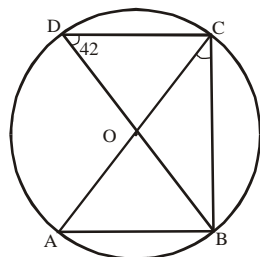
a) $\sqrt{287}$ cm b) $\sqrt{189}$
c) 17 cm d) 13 cm

60. In the figure, the chord PQ = chord RS then
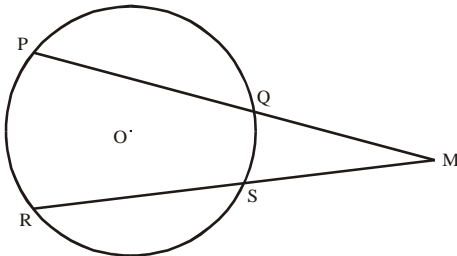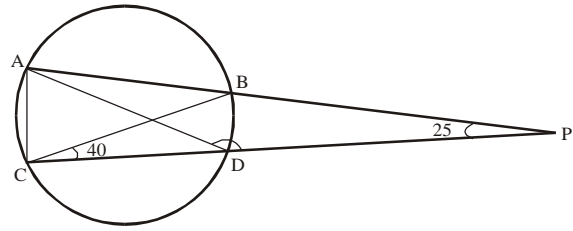

a) QM = SM b) QM>SM
c) QM<SM d) QM = 2 SM

61. In the fig., O is the centre of a circle and ∠BDC = 42° then ∠ACB is

a) 42° b) 21°
c) 84° d) 48°

62. The chord AB and CD of a circle meet at P as shown in the fig 56. If ∠BPC =25° then angle ∠ADP will be

a) 65° b) 140°
c) 115° d) 155°

63. A circle is the locus of
   a) a moving point
   b) stationary point
   c) Arc
   d) None of these

64. Two concentric circles of radii 8 cm and 5 cm are drawn. A line PQRS intersects the outer circle at Points P and S and the inner circle at Q and R. If QR = 6 the length of PQ in cm is

a) 3 b) $4\sqrt{3}$
c) $4\sqrt{3} - 3$ d) $4\sqrt{3} + 3$

65. In the figure, the sides of Δ ABC are 12, 14 and 16 cm. three circles are drawn with centres A, B and C each one touching other two. Then their radii are
   a) 7, 5 and 9 cm
   b) 5, 7 and 8 cm
   c) 4.5 , 3.5 and 2.5 cm
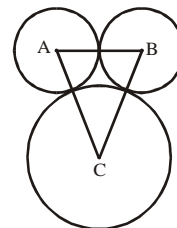
   d) None of these

66. Three circles with radii 7,5 and 9cm with centers A,B and C (See Fig. for Q. No. 65) respectively touch each other externally. The perimeter of the Δ ABC will

a) 21 cm   b) 42cm
c) 11 cm   d) None of these

67. A square ABCD is inscribed in a circle of radius 7 cm. then length of side of the square is

   a) $7\sqrt{2}$ cm   b) $\dfrac{1}{\sqrt{2}}$ 7cm

   c) 49 cm   d) 14 cm

68. ABCD is a square inscribed in a circle of radius 7cm. Then the area of this square will be
   a) 49 cm²   b) 98 cm²
   c) 24.5 cm²   d) 196 cm²

69. In figure AB is the diameter of a circle with centre O, CD is a chord. if ∠BOD = 100° then ∠ACD will be equal to
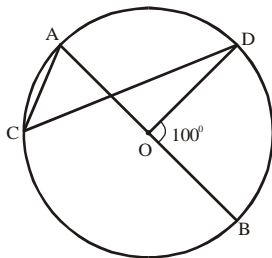
   a) 80°   b) 50°
   c) 20°   d) 40°

70. In figure, O is centre of circle if ∠OAB = 44° then ∠ACB will equal to
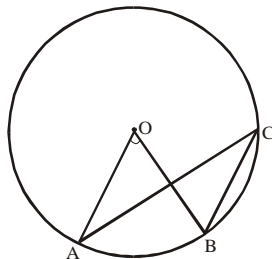
   a) 22°   b) 56°
   c) 44°   d) 34°

71. State which of the following quadrilateral is always a cyclic quadrilateral
   a) Parallelogram
   b) Square
   c) Rhombus
   d) Trapezium

72. In the figure for Q. No. 71 ∠QLR will be equal to
   a) 50°   b) 40°
   c) 80°   d) 60°

73. In the figure, shown if ∠QSR = 35° then ∠STR will be equal to
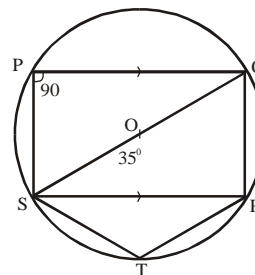
   a) 125°   b) 70°
   c) 110°   d) 55°

74. In the figure, ∠BAC = 55° and BED = 85° then ∠ABC will be equal to
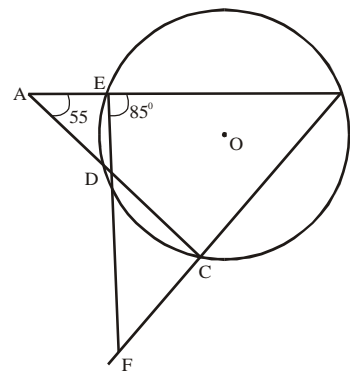
   a) 35°   b) 40°
   c) 55°   d) 30°

75. In the figure for Q.No. 74 ∠DFE will be equal to
    a) 95°   b) 85°
    c) 65°   d) 55°

76. Two circles touch each other externally at C and AB is a common tangent to the circle then ∠ACB is equal to
    a) 60°   b) 45°
    c) 30°   d) 90°

77. In the figure shown ∠ADB = 60° and ∠CAB = 20° then ∠ABC is
    a) 100°   b) 90°
    c) 60°   d) 20°
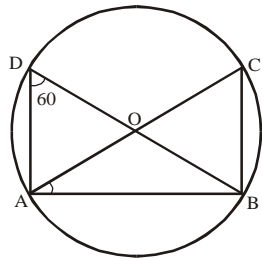
78. In the figure, shown AD is a chord ∠CED = 40, ∠EDC = 30°, then ∠ABD is equal to
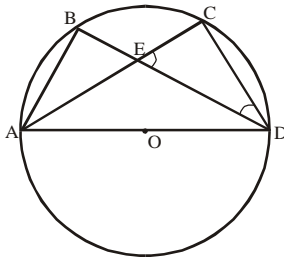
    a) 90°   b) 40°
    c) 70°   d) 110°

79. State which is not true
    a) The diagonals of parallelogram inscribed in a circle are always equal.
   b) The diagonals of all cyclic quadrilateral are equal.

c) The diagonals of a rectangle inscribed in a circle always pass through the centre
d) A trapezium with equal non parallel sides is cyclic quadrilateral.

80. If four sides of a quadrilateral ABCD are tangent to a circle then
    a) AC+AD = BD+CD
    b) AB+CD = BC+AD
    c) AB+CD = AC+BC
    d) AC+AD = BC+DB

81. Choose the correct answer
    a) Any parallelogram is cyclic quadrilateral.
    b) A kite is always a cyclic quadrilateral.
    c) A trapezium can be a cyclic quadrilateral.
    d) A rhombus is cyclic quadrilateral.

82. What is the area of the circle with radius of 7 cm
    a) 48π cm   b) 49π cm
    c) 47π cm   d) 46π cm

83. In the figure shown ∠RSP will be equal to
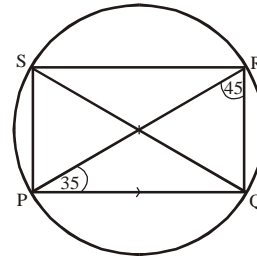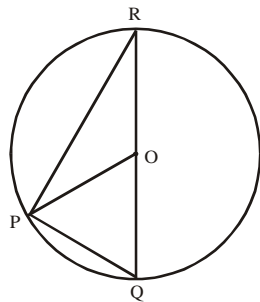

    a) 80°   b) 100°
    c) 90°
    d) None of the above

84. If opposite angles of a quadrilateral are supplementary, then the quadrilateral is called.
    a) Rhombus
    b) Trapezium
    c) Cyclic quadrilateral
    d) Rectangle

85. If TP and TQ are two tangents to a circle with centre O so that ∠POQ=110° then ∠PTQ =
    a) 60°
    b) 70°
    c) 80°
    d) 90°

86. In fig a circle with centre O, ∠PQR = 72° the measure of ∠OQP will be


    a) 54°
    b) 72°
    c) 36°
    d) 90°

87. Which of the following is a cyclic quadrilateral.
    a) A quadrilateral whose opposite angles 100° and 90°.
    b) A parallelogram whose one angle is 100° and 90°.
    c) A rombus
    d) A square

88. In the figure, O is the centre of circle ∠AOC = 100°, ∠AOB =40° then ∠BAC will be
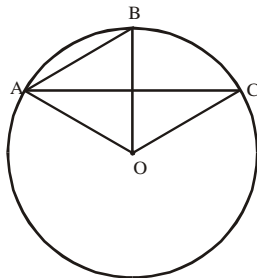
    a) 30°
    b) 60°
    c) 40°
    d) 20°

89. In the given figure, AB is a tangent at K. if ∠LON is the diameter and ∠KLN = 30° then ∠AKL is equal to
    a) 30°
    b) 50°
    c) 60°
    d) 70°
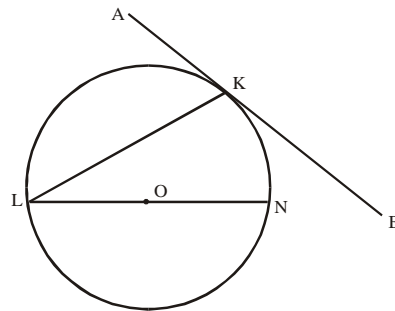
90. As shown in the figure, AB is a tangent at T to a circle with centre O. If ∠ATP is 40° then ∠TPQ is
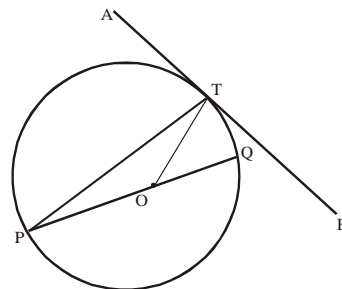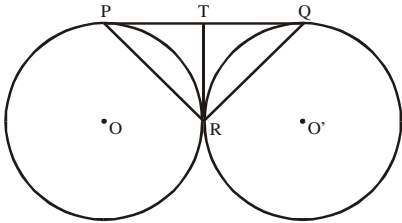

    a) 50°
    b) 40°
    c) 80°
    d) 25°

91. Two equal circles of radius r intersect such that each passes through the centre of the other. The length of the common chord is
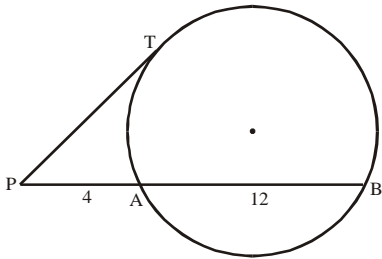   a) $\sqrt{r}$
    b) $\sqrt{2}r$
    c) $\sqrt{3}r$
    d) $\dfrac{\sqrt{3}}{2}r$

92. Two circles touch each other externally at R and PQ is a common tangent to the circles as shown in the figure then.

a) $\angle PRQ = 90°$
b) $\angle PRQ < 90°$
c) $\angle PRQ > 90°$
d) $\angle PRQ > 120°$

a) $OB = OC$
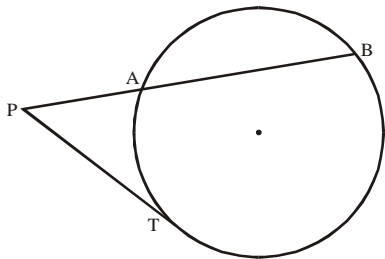b) $OB = OD$
c) $OB = 2BC$
d) $OB < BC$

93. In figure, PT is a tangent to the circle. If PA = 4cm and AB = 12 cm. then PT is cm is equal to

a) $\sqrt{48}$ b) 8

c) $4\sqrt{7}$ d) 4

96. In figure AB and CD are two chords of a circle intersecting at a point E inside a circle. Then AB will be equal to

a) 12 cm   b) 11 cm
c) 10 cm   d) 20 cm
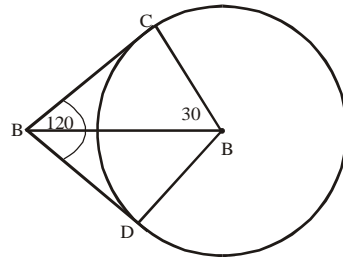
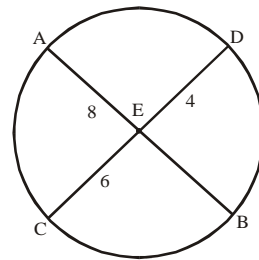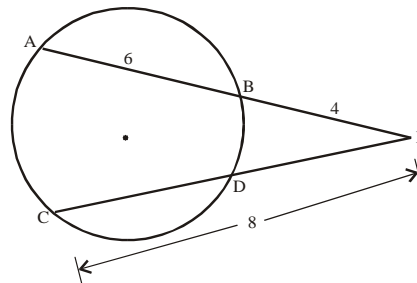94. In figure if AP = 4.5 and AB = 13.5 then the length of tangent PT is

a) 9   b) 3
c) 81   d) 14.38

95. In figure, BC and BD are two tangents to a circle with centre O, if $\angle CBD = 120°$ then

97. In figure, if AB and CD are two chords of a circle which when produced meet at a point E. if AB = 6, EB = 4cm, EC = 8 cm then ED will be equal to
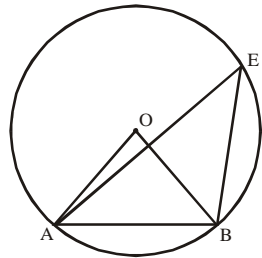

a) 3 cm   b) 5.67 cm
c) 5 cm   d) 2 cm

98. PQ and LM are two two chords of a circle which intersect at E out side the circle. EL = 10 cm , EP = 16 cm, EM = 8cm then PQ is equal to
a) 11 cm
b) 5 cm
c) 8 cm
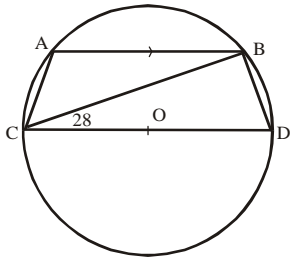d) 3.2 cm

99. Choose the correct statement (see figure)

a) $\lfloor AOB = \lfloor AEB$ O is the centre of the circle

b) $\lfloor AOB = \dfrac{1}{2} \lfloor AEB$

c) $\lfloor AOB < \lfloor AEB$

d) $\lfloor AOB = 2 \lfloor AEB$

100. In the figure for Q. No. 99 shown, O is the centre of the circle $\angle BCD = 28°$ then $\angle BCA$ will be equal to
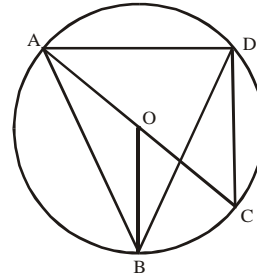a) 28°
b) 34°
c) 62°
d) 56°

101. In the figure, shown O is the centre of the circle $\angle BCD = 28°$ then $\angle BCA$ is

a) 28^0
b) 34^0
c) 62^0
d) 56^0

102. In the figure, shown O is the centre of the circle $\angle ABO = 33°$ then $\angle BDC$ is
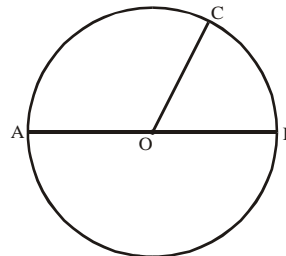

a) 90°
b) 33°
c) 72°
d) 57°

103. What is the formula to find the length of a chord
a) $2r \sin\theta$
b) $2r \sin \theta/2$
c) $r \sin \theta/2$
d) None of these
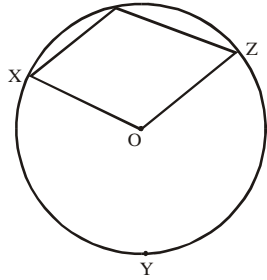
104. State which of the following is not a regular polygon
a) An equilateral triangle
b) A square
c) A regular hexagon
d) Pentagon

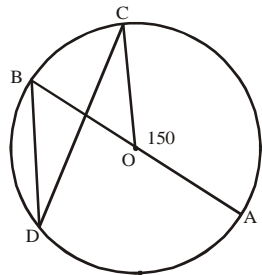105. In figure, AB is a diameter of the circle with centre O. $\angle COB = 35°$ the measure of major arc BC is

a) 145°
b) 215°
c) 325°
d) 180°

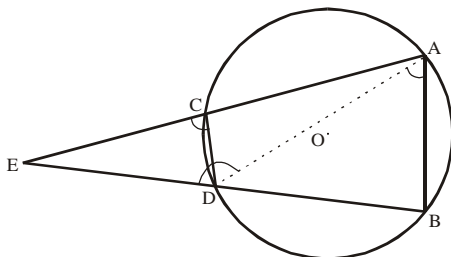106. In the figure, shown the measure of major Arc XYZ is 260° then the measure of minor Arc XZ will be

a) 100° b) 130°
c) 110° d) 50°

107. In the figure, shown AB is the diameter of the circle with center O. If ∠AOC = 150° the measure of ∠CDB will be
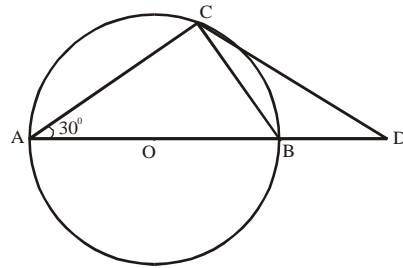

a) 30° b) 15°
c) 90° d) 45°

108. In the figure, AB = BD, ∠BAD = 56° , ∠ADC = 27° then the measure of ∠ECD will be

a) 68° b) 54°
c) 56° d) 90°

109. In figure, AB is a diameter and AC is a chord of a circle. ∠BAC = 30°. The tangent at C intersects AB produced at D. then

a) BC < BD b) BC > BD
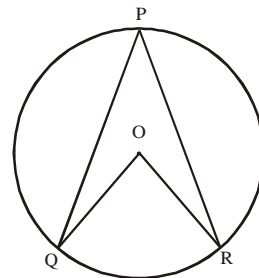c) BC = BD d) BC = ½ BD

110. An equilateral triangle PQR is intersect in a circle with centre O. then ∠QOR is equal to
a) 30° b) 60°
c) 90° d) 120°

111. In the figure, shown O is the centre of the circle ∠PQO = 50°, ∠PRO= 60° then QOP will be
a) 220° b) 55°
c) 110° d) 120°

112. AB is the diameter of the circle and O is centre then /ACO is equal to
a) 40° b) 130°
c) 70° d) 100°

113. In figure, O is the centre of the circle ∠PRQ is equal to
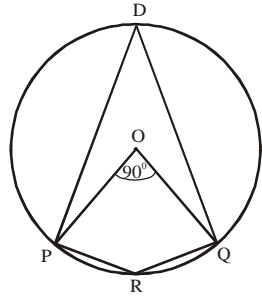
a) 90°
b) 180°
c) 45°
d) 135°

114. A circular swimming pool has a radius of 14 meter. Find the circumference of the pool.
a) 80m
b) 88m
c) 78m
d) 87m

115. Find an equaltion of the circle with radius 3 and center (2, -5)
a) $x^2+y^2+4x-10y-20=0$
b) $x^2+y^2-4x+10y+20=0$
c) $x^2+y^2+4x+10y+20=0$
d) None of these

116. Chord equidistant from the centre are
a) equal
b) unequal
c) parallel
d) None of these

Key (Circle)

1	c	25	c	49	c	73	a	97	c
2	c	26	a	50	b	74	d	98	a
3	a	27	a	51	c	75	c	99	d
4	a	28	d	52	a	76	d	100	a
5	d	29	a	53	b	77	a	101	a
6	b	30	c	54	a	78	d	102	c
7	c	31	d	55	c	79	b	103	b
8	d	32	a	56	a	80	b	104	d
9	b	33	a	57	c	81	a	105	c
10	d	34	a	58	b	82	b	106	a
11	d	35	c	59	d	83	a	107	b
12	a	36	d	60	a	84	c	108	a
13	c	37	d	61	d	85	b	109	c
14	b	38	a	62	c	86	a	110	d
15	b	39	d	63	a	87	d	111	a
16	a	40	a	64	c	88	a	112	a
17	d	41	a	65	a	89	c	113	a
18	c	42	a	66	b	90	a	114	b
19	b	43	b	67	a	91	c	115	b
20	a	44	d	68	b	92	a	116	a
21	b	45	a	69	d	93	b		
22	d	46	d	70	c	94	a		
23	b	47	d	71	b	95	c		
24	b	48	c	72	b	96	b		