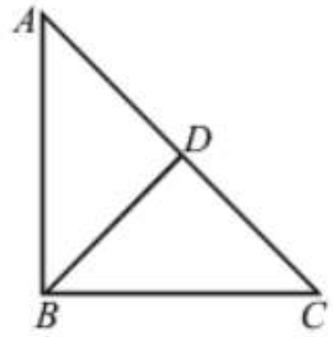
Practice Exercise

Level - I

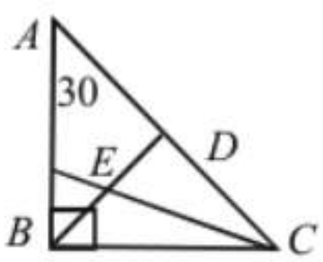
1. In triangle ABC, angle B is a right angle. If (AC) is 6 cm, and D is the mid-point of side AC. The length of BD is



(a) 4 cm (b) $\sqrt{6}$cm

(c) 3 cm (d) 3.5 cm

2. $AB \perp BC$ and $BD \perp AC$. And CE bisects the angle C. $\angle A = 30^\circ$. The, what is $\angle CED$.



(a) 30° (b) 60°

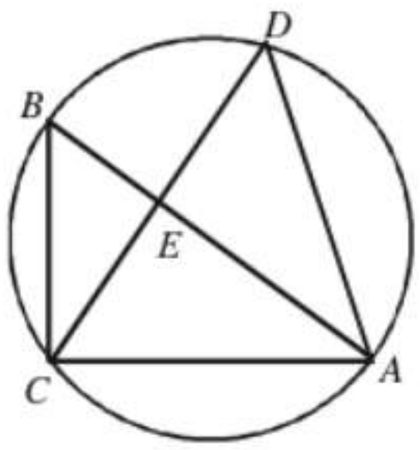
(c) 45° (d) 65°

3. If two parallel lines are cut by two distinct transversals, then the quadrilateral formed by these four lines will always be a :

(a) parallelogram (b) rhombus

(c) square (d) trapezium

4. In the adjoining the figure, points A, B, C and D lie on the circle. $AD = 24$ and $BC = 12$. What is the ratio of the area of the triangle CBE to that of the triangle ADE



(a) 1 : 4 (b) 1: 2

(c) 1 : 3 (d) Insufficient data

5. In ΔABC, AD is the bisector of $\angle A$ if $AC = 4.2$ cm., $DC = 6$ cm., $BC = 10$ cm., find AB.

(a) 2.8 cm (b) 2.7 cm

(c) 3.4 cm (d) 2.6 cm

6. How many sides a regular polygon has with its sum of interior angles eight times its sum of exterior angles?

(a) 16 (b) 24

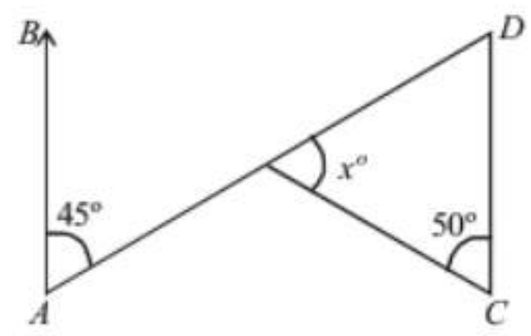
(c) 18 (d) 30

7. A point P is 26 cm away form the centre O of a circle and the length PT of the tangent draw from P to the circle is 10cm. Find radius of the circle

(a) 2.4 cm (b) 3.2 cm

(c) 2.2 cm (d) 4.2 cm

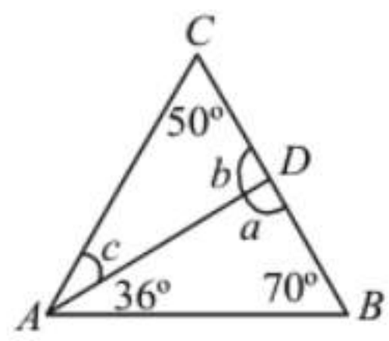
8. In the given figure, $AB \parallel CD$, $\angle BAE = 45^\circ$, $\angle DCE = 50^\circ$ and $\angle CED = x$, then find the value of x.



(a) 85° (b) 95°

(c) 60° (d) 20°

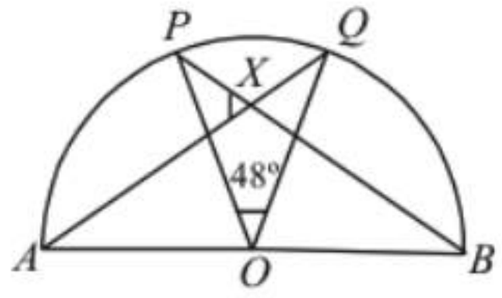
9. Given the adjoining figure. Find a, b, c



(a) 74°, 106°, 20° (b) 90°, 20°, 24°

(c) 60°, 30°, 24° (d) 106°, 24°, 74°

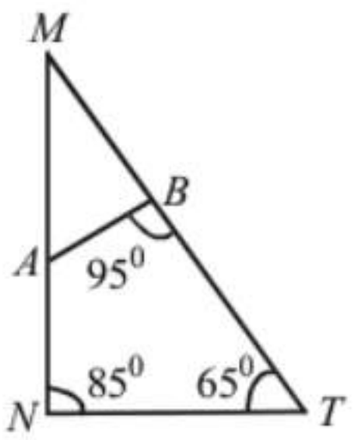
10. In the figure given below, AB is a diametre of the semicircle $APQB$, centre O, $\angle POQ = 48^\circ$ cuts BP at X, calculate $\angle AXP$.



(a) 50° (b) 55°

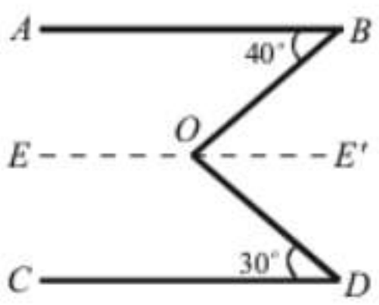
(c) 66° (d) 40°

11. In the figure , if $\frac{NT}{AB} = \frac{9}{5}$ and if $MB = 10$, find MN.



(a) 5 (b) 4
(c) 28 (d) 18

12. In the given figure, $AB \parallel CD$, $\angle ABO = 40°$ and $\angle CDO = 30°$. If $\angle DOB = x$, then find the value of x.

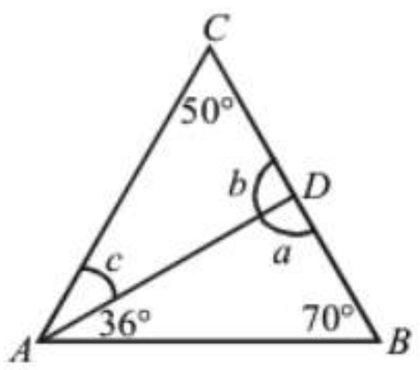


(a) 10° (b) 70°
(c) 110° (d) 20°

13. M and N are points on the sides PQ and PR respectively of a ΔPQR. For each of the following cases state whether MN is parallel to QR

A. $PM = 4$, $QM = 4.5$, $PN = 4$, $NR = 4.5$
B. $PQ = 1.28$, $PR = 2.56$, $PM = 0.16$, $PN = 0.32$
(a) only in case A
(b) only in case B
(c) both in the case A & B
(d) None of these

14. Given the adjoining figure. Find a, b, c.



(a) 74°, 106°, 24° (b) 90°, 20°, 24°
(c) 60°, 30°, 24° (d) 106°, 24°, 74°

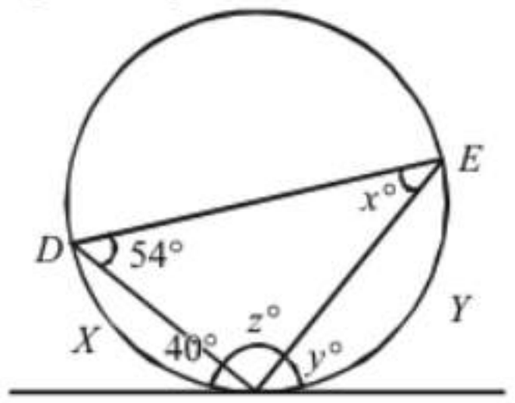
15. The perimeters of two similar Δs ABC and PQR are respectively 36 cm and 24 cm. If $PQ = 10$ cm, then AB is equal to

(a) 5 cm (b) 10 cm
(c) 15 cm (d) 9 cm

16. In the triangle ABC, AD bisects $\angle BAC$, $BC = 6.4$, $AB = 5$ and $AC = 3$, then the length of BD is equal to

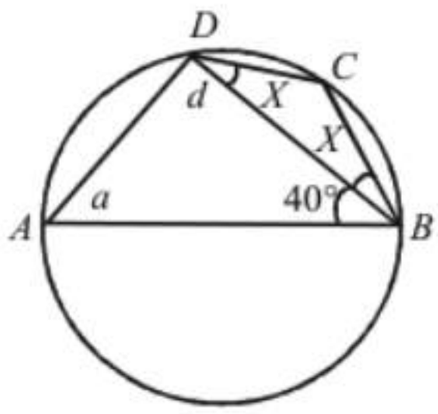
(a) 3.5 (b) 5.5
(c) 3.2 (d) 4

17. In the given figure, $m\angle EDC = 54°$, $m\angle DCA = 40°$. Find x, y and z respectively.



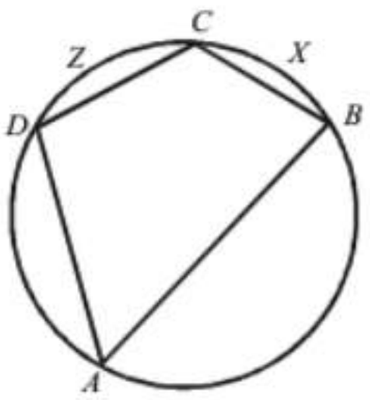
(a) 20°, 27°, 86° (b) 40°, 54°, 86°
(c) 20°, 27°, 43° (d) 40°, 54°, 43°

18. In the adjoining figure, $ABCD$ is a cyclic quadrilateral. If AB is a diameter, $BC = CD$ and $\angle ABD = 40°$, find the measure of $\angle DBC$.



(a) 65 (b) 25
(c) 45 (d) 60

19. In the cyclic quadrilateral $ABCD$, $\angle BCD = 120°$, m (arc DZC) = 70°, find $\angle DAB$ and m(arc CXB).

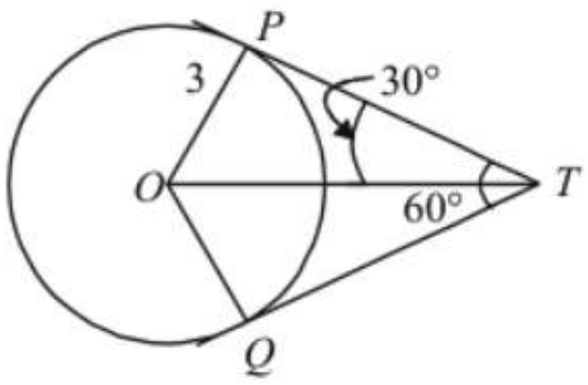


(a) 60°, 70° (b) 60°, 40°
(c) 60°, 50° (d) 60°, 60°

20. In the above figure (ii), angle c is –

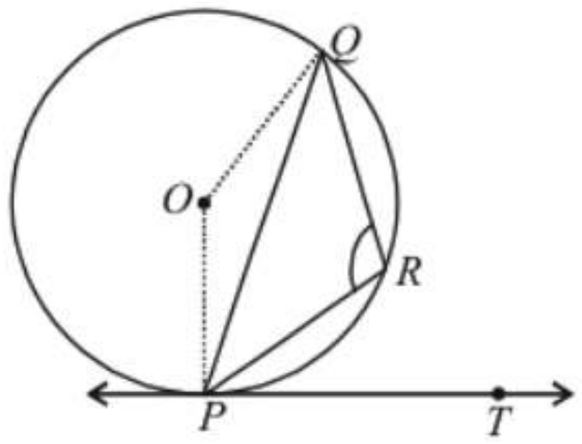
(a) 270° (b) 70°
(c) 105° (d) 45°

21. If two tangents inclined at an angle 60° are drawn to a circle of radius 3 cm, then length of each tangent is equal to



(a) $\frac{3}{2}\sqrt{2}$ cm (b) 6 cm
(c) 3 cm (d) $3\sqrt{3}$ cm

22. In the given fig. PQ is a chord of a circle and PT is the tangent at P such that $\angle QPT = 60°$. Then $\angle PRQ$ is equal to

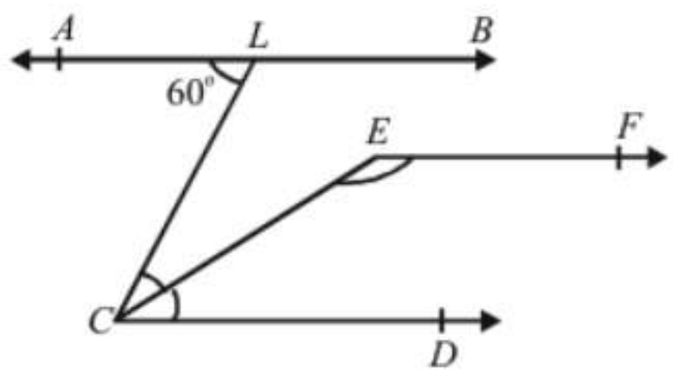


(a) 135° (b) 150°
(c) 120° (d) 110°

23. If four sides of a quadrilateral $ABCD$ are tangential to a circle, then.

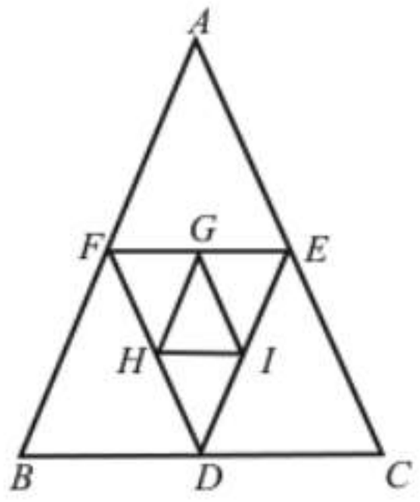
(a) $AC + AD = BD + CD$ (b) $AD + BC = AB + CD$
(c) $AB + CD = AC + BC$ (d) $AC + AD = BC + DB$

24. In the given figure, $AB \parallel CD$, $\angle ALC = 60°$, EC is the bisector of $\angle LCD$ and $EF \parallel AB$. Then, find the measure of $\angle CEF$.



(a) 80° (b) 130°
(c) 120° (d) 150°

25. D, E, F are midpoints of BC, CA and AB respectively. G, H, I are midpoints of FE, FD, DE respectively. Areas of ΔDHI and ΔAFE are in the ratio

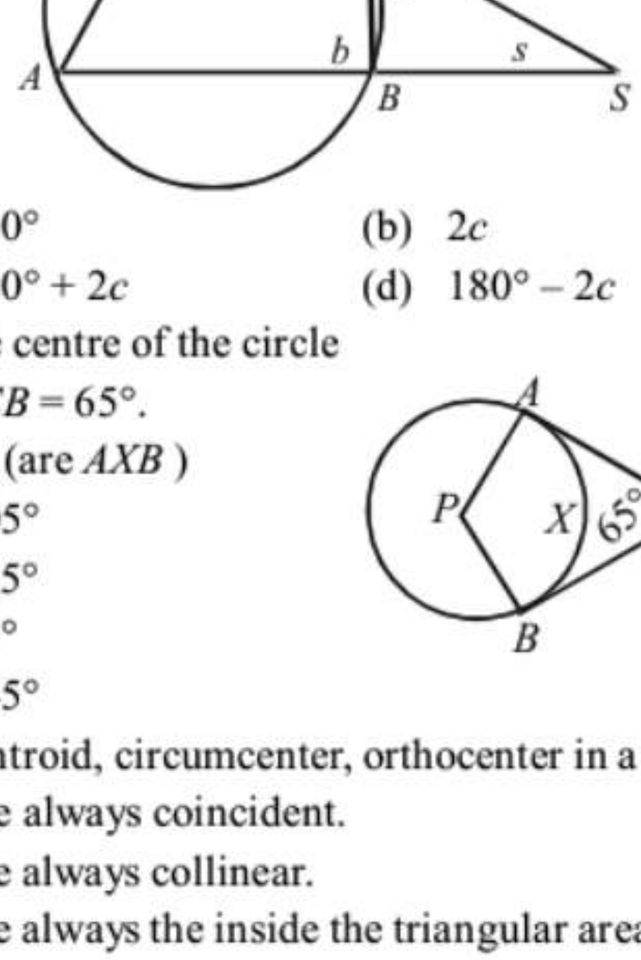


(a) 1 : 3 (b) 1 : 4
(c) 1 : 9 (d) 1 : 16

26. John wishes to determine the distance between two objects A and B, but there is an obstacle between the two objects which prevents him from making a direct measurement. He designed an ingenious way to overcome this difficulty. First, he fixes a pole at convenient point O so that from O, both ends are visible. Then he fixes another pole at a point D on the line AO (produced) such that $AO = DO$. In a similar way, he fixes a third pole at a point C on the line BO (produced) such that $BO = CO$. Then he measures CD and finds that $CD = 170$ cm. Find the distance between the objects A and B.

(a) 90 cm (b) 170 cm
(c) 140 cm (d) 150 cm

27. In the adjoining figure, $ABCD$ is a cyclic quadrilateral. Then $r + s$ is equal to



(a) 180° (b) $2c$
(c) $180° + 2c$ (d) $180° - 2c$

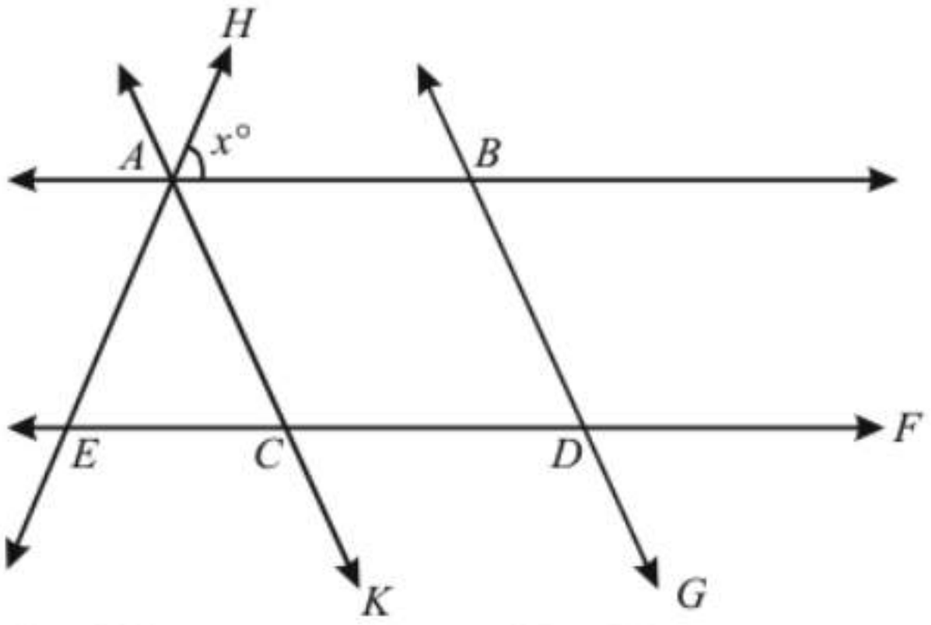
28. P is the centre of the circle
$m\angle ACB = 65°$.
Find m (are AXB)

(a) 105°
(b) 115°
(c) 65°
(d) 245°

29. The centroid, circumcenter, orthocenter in a triangle–

(a) are always coincident.
(b) are always collinear.
(c) are always the inside the triangular area.
(d) always coincide in a equilateral triangle and otherwise collinear.

30. In the given figure $AB \parallel CD$ and $AC \parallel BD$. If $\angle EAC = 40°$, $\angle FDG = 55°$, $\angle HAB = x°$, then find the value of x.



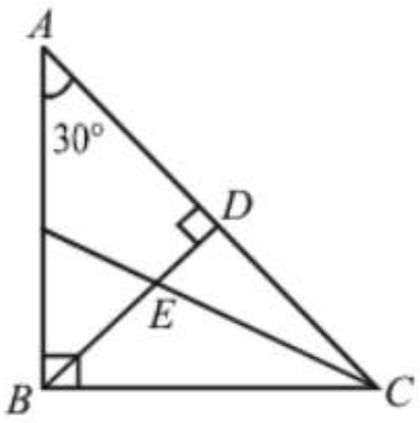
(a) 85° (b) 75°
(c) 65° (d) 55°

31. Which one of the following cannot be the ratio of angles in a right angled triangle?

(a) 1 : 2 : 3 (b) 1 : 1 : 2

(c) 1 : 3 : 6 (d) None of these

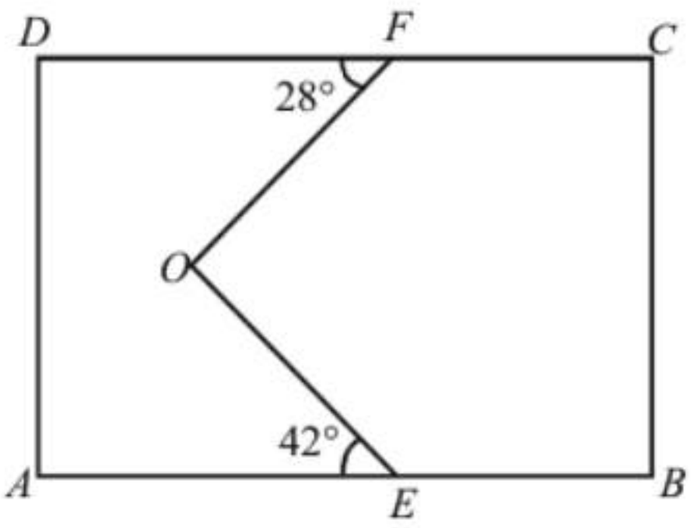
32. In ΔABC, $AB \perp BC$ and $BD \perp AC$. And CE bisects the angle C. $\angle A = 30°$. What is $\angle CED$?



(a) 30° (b) 60°

(c) 45° (d) 65°

33. In the adjoining figure $ABCD$ is a rectangle and $DF = CF$ also, $AE = 3BE$. What is the value of $\angle EOF$, if $\angle DFO = 28°$ and $\angle AEO = 42°$?



(a) 14° (b) 42°

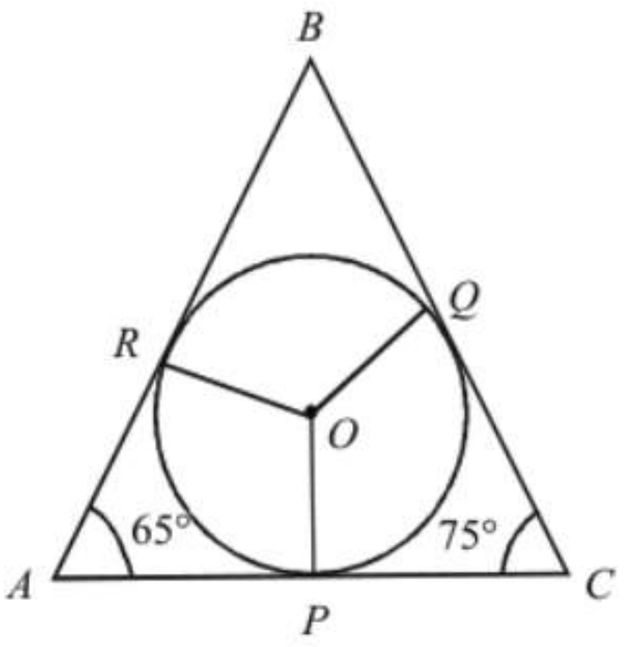
(c) 70° (d) 90°

34. Each interior angle of a regular polygon exceeds its exterior angle by 132°. How many sides does the polygon have?

(a) 9 (b) 15

(c) 12 (d) None of these

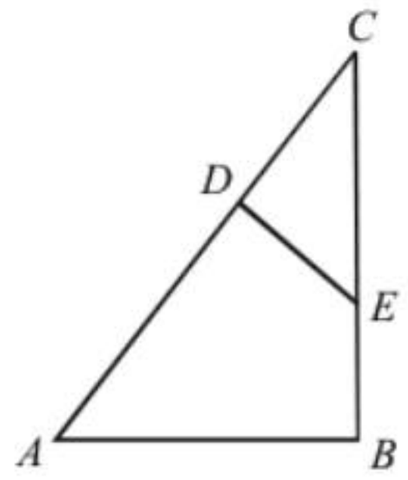
35. In a triangle ABC, O is the centre of incircle PQR, $\angle BAC = 65°$, $\angle BCA = 75°$, find $\angle ROQ$:



(a) 80° (b) 120°

(c) 140° (d) can't be determined

36. ABC and CDE are right angled triangle. $\angle ABC = \angle CDE = 90°$. D lies on AC and E lies on BC. $AB = 24$ cm, $BC = 60$ cm. If $DE = 10$ cm, then CD is:



(a) 28 cm (b) 35 cm

(c) 25 cm (d) can't be determined

37. The largest angle of a triangle of sides 7 cm, 5 cm and 3 cm is

(a) 45° (b) 60°

(c) 90° (d) 1200

38. $ABCD$ is a paralellogram in which $\angle B = 70°$. Find the number of points X in the plane of the parallelogram such that it is equidistant from its vertices.

(a) zero (b) one

(c) two (d) three

39. $PQRS$ is trapezium, in which PQ is parallel to RS, and $PQ = 3\,(RS)$. The diagonal of the trapezium intersect each other at X, then the ratio of ΔPXQ and ΔRXS is

(a) 6 : 1 (b) 3 : 1

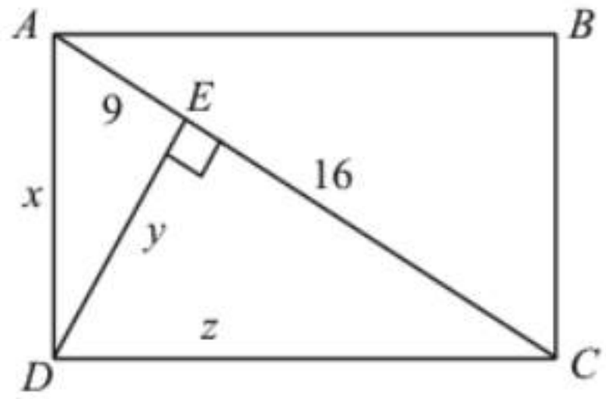
(c) 9 : 1 (d) 7 : 1

40. C is the midpoint of DE. Area of parallelogram $ABCD = 16$ sq. cm. Find the area of $\Delta\, BCDE$.

(a) 8 sq.cm (b) 16 sq. cm

(c) 32 sq. cm (d) 24 sq. cm

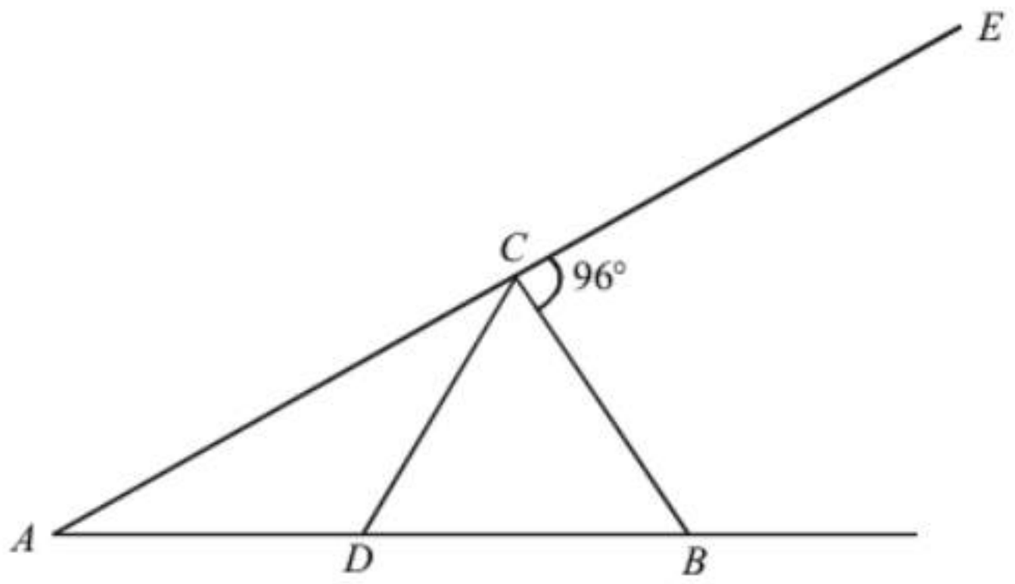
41. What are the respective value of x, y and z in the given rectangle $ABCD$?



(a) 15, 12, 20 (b) 12, 15, 20

(c) 8, 10, 12 (d) None of these

42. In the figure (not drawn to scale) given below, if $AD = CD = BC$, and $\angle BCE = 96°$, how much is $\angle DBC$?

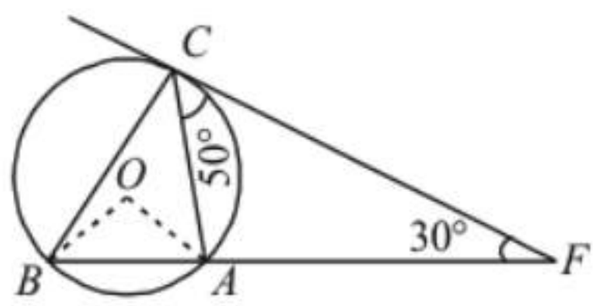


(a) 32° (b) 84°
(c) 64° (d) Cannot be determined

43. In a trapezium $ABCD$, $AB \parallel CD$ and $AD = BC$. If P is point of intersection of diagonals AC and BD, then all of the following is wrong except.

(a) $PA.PB = PC.PD$ (b) $PA.PC = PB.PD$
(c) $PA.AB = PD.DC$ (d) $PA.PD = AB.DC$

44. Find $\angle BOA$.



(a) 100° (b) 150°
(c) 80° (d) Indeterminate

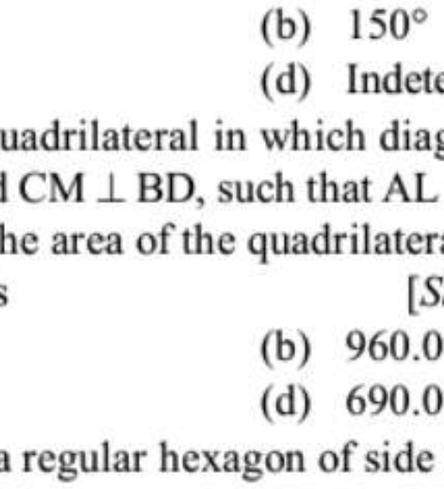
45. ABCD is a quadrilateral in which diagonal BD = 64 cm, AL ⊥ BD and CM ⊥ BD, such that AL = 13.2 cm and CM = 16.8 cm. The area of the quadrilateral ABCD in square centimetres is [*SSC-Sub. Ins.-2012*]

(a) 537.6 (b) 960.0
(c) 422.4 (d) 690.0

46. ABCDEF is a regular hexagon of side 2 feet. The area, in square feet of the rectangle BCEF is [*SSC-Sub. Ins.-2012*]

(a) 4 (b) $4\sqrt{3}$
(c) 8 (d) $4+4\sqrt{3}$

47. The area of the shaded region in the following graph is [*SSC-Sub. Ins.-2012*]

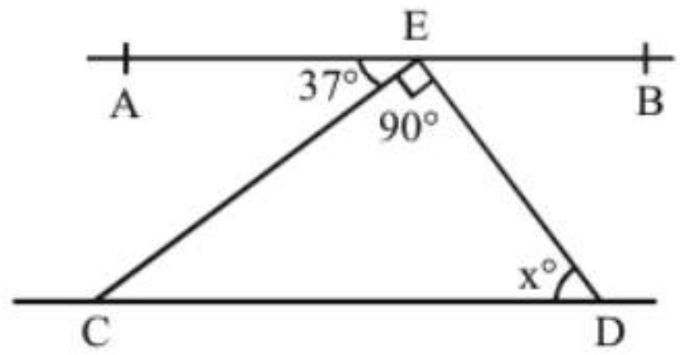


(a) 2 units (b) 4 units
(c) 6 units (d) 8 units

48. In ΔABC, ∠B = 60°, ∠C = 40°. If AD bisects ∠BAC and AE ⊥ BC, then ∠EAD is [*SSC-Sub. Ins.-2012*]

(a) 40° (b) 80°
(c) 10° (d) 20°

49. In the figure below, if AB || CD and CE ⊥ ED, then the value of x is [*SSC-Sub. Ins.-2012*]



(a) 37 (b) 45
(c) 53 (d) 63

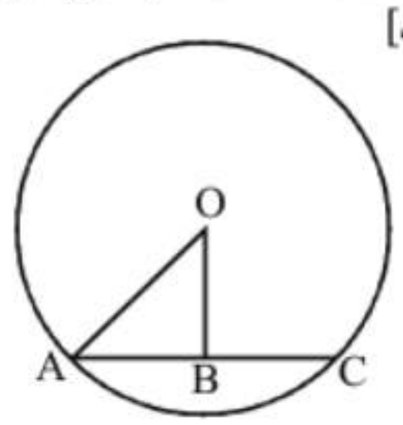
50. PA and PB are two tangents drawn from an external point P to a circle with centre O where the points A and B are the points of contact. The quadrilateral OAPB must be [*SSC-Sub. Ins.-2012*]

(a) a square (b) concylic
(c) a rectangle (d) a rhombus

51. G is the centroid of ΔABC. If AG = BC, then ∠BGC is [*SSC-Sub. Ins.-2012*]

(a) 60° (b) 120°
(c) 90° (d) 30°

52. In the following figure, if OA = 10 and AC = 16, then OB must be [*SSC-Sub. Ins.-2012*]

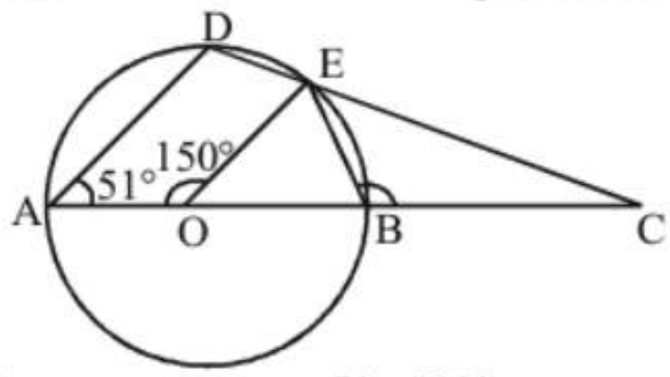


(a) 3 (b) 4
(c) 5 (d) 6

53. Triangle PQR circumscribes a circle with centre O and radius r cm such that ∠PQR = 90°. If PQ = 3 cm, QR= 4 cm, then the value of r is : [*SSC-Sub. Ins.-2013*]

(a) 2 (b) 1.5
(c) 2.5 (d) 1

54. In the following figure. AB be diameter of a circle whose centre is O. If ∠AOE = 150°. ∠DAO = 51° then the measure of ∠CBE is: [*SSC-Sub. Ins.-2013*]



(a) 115° (b) 110°
(c) 105° (d) 120°

55. The areas of two similar triangles ABC and DEF are 20 cm^2 and 45 cm^2 respectively. If AB = 5 cm. then DE is equal to: [*SSC-Sub. Ins.-2013*]

(a) 6.5 cm (b) 7.5 cm
(c) 8.5 cm (d) 5.5 cm

56. In a triangle ABC, BC is produced to D so that CD = AC. If $\angle BAD = 111°$ and $\angle ACB = 80°$, then the measure of $\angle ABC$ is: [*SSC-Sub. Ins.-2013*]

(a) 31° (b) 33°
(c) 35° (d) 29°

57. In ΔABC, $\angle A + \angle B = 145°$ and $\angle C + 2\angle B = 180°$. State which one of the following relations is true? [*SSC-Sub. Ins.-2013*]

(a) CA = AB (b) CA < AB
(c) BC > AB (d) CA > AB

58. In a Δ ABC, $\frac{AB}{AC} = \frac{BD}{DC}$, $\angle B = 70°$ and $\angle C = 50°$, then $\angle BAD =$ [*SSC-Sub. Ins.-2014*]

(a) 60° (b) 20°
(c) 30° (d) 50°

59. In a Δ ABC, AD, BE and CF are three medians. The perimeter of ΔABC is always [*SSC-Sub. Ins.-2014*]

(a) equal to $\left(\overline{AD} + \overline{BE} + \overline{CF}\right)$

(b) greater than $\left(\overline{AD} + \overline{BE} + \overline{CF}\right)$

(c) less than $\left(\overline{AD} + \overline{BE} + \overline{CF}\right)$

(d) None of these

60. In a Δ ABC, $\overline{AD}$, $\overline{BE}$ and $\overline{CF}$ are three medians. Then the ratio $\left(\overline{AD} + \overline{BE} + \overline{CF}\right) : \left(\overline{AB} + \overline{AC} + \overline{BC}\right)$ is [*SSC-Sub. Ins.-2014*]

(a) equal to $\frac{3}{4}$ (b) less than $\frac{3}{4}$
(c) greater than $\frac{3}{4}$ (d) equal to $\frac{1}{2}$

61. Two circles with radii 25 cm and 9 cm touch each other externally. The length of the direct common tangent is [*SSC-Sub. Ins.-2014*]

(a) 34 cm (b) 30 cm
(c) 36 cm (d) 32 cm

62. If AB = 5 cm, AC = 12 and $AB \perp AC$, then the radius of the circumcircle of ΔABC is [*SSC-Sub. Ins.-2014*]

(a) 6.5 cm (b) 6 cm
(c) 5 cm (d) 7 cm

63. ABC is a right angled triangle, right angled at C and p is the length of the perpendicular from C on AB. If a, b and c are the lengths of the sides BC, CA and AB respectively, then [*SSC 10+2-2012*]

(a) $\frac{1}{p^2} = \frac{1}{b^2} - \frac{1}{a^2}$ (b) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

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

64. From a point P, two tangents PA and PB are drawn to a circle with centre O. If OP is equal to diameter of the circle, then $\angle APB$ is [*SSC 10+2-2013*]

(a) 60° (b) 45°
(c) 90° (d) 30°

65. A chord 12 cm long is drawn in a circle of diameter 20 cm. The distance of the chord from the centre is [*SSC 10+2-2013*]

(a) 16 cm (b) 8 cm
(c) 6 cm (d) 10 cm

66. If in Δ ABC, $\angle ABC = 5\angle ACB$ and $\angle BAC = 3\angle ACB$, then $\angle ABC =$ [*SSC 10+2-2013*]

(a) 120° (b) 130°
(c) 80° (d) 100°

67. The perpendiculars, drawn from the vertices to the opposite sides of a triangle, meet at the point whose name is [*SSC 10+2-2013*]

(a) orthocentre (b) incentre
(c) circumcentre (d) centroid

68. In ΔABC, D and E are two points on the sides AB and AC respectively so that DE||BC and $\frac{AD}{BD} = \frac{2}{3}$. Then $\frac{\text{the area of trapezium DECB}}{\text{the area of } \Delta ABC}$ is equal to [*SSC 10+2-2014*]

(a) $\frac{5}{9}$ (b) $\frac{21}{25}$
(c) $1\frac{4}{5}$ (d) $5\frac{1}{4}$

69. One of the angles of a parallelogram is 45°. What will be the sum of the larger angle and twice the smaller angle of the parallelogram ? [*IBPS Clerk-2012*]

(a) 228° (b) 224°
(c) 225° (d) 222°
(e) None of these

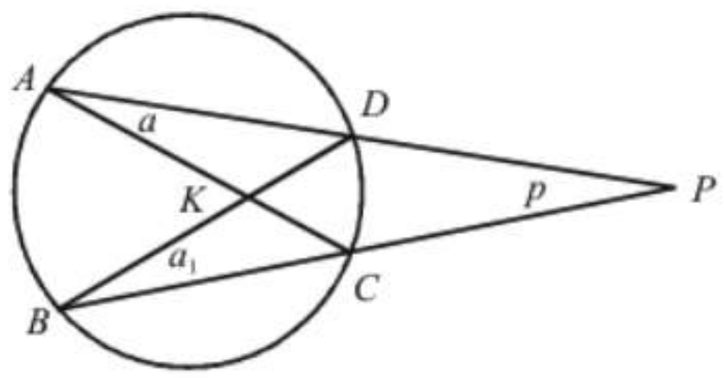
Level - II

1. Here XY has been divided into 5 congruent segments and semicircles have been drawn. But suppose XY were divided into millions of congruent segments and semicircles were drawn, what would the sum of the lengths of the arcs be?

(a) $2YX$ (b) $5XY$

(c) XY (d) None of these

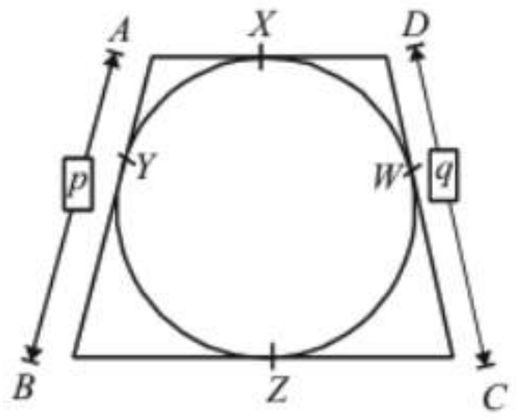
2. In the adjoining figure, chord AD and BC of a circle are produced to meet at P, $PA = 10$ cm, $PB = 8$ cm, $PC = 5$ cm, $AC = 6$ cm. Find BD, PD.



(a) 5.8, 3 (b) 3.8, 5

(c) 2.8, 6 (d) 4.8, 4

3. In the adjoining figure the circles touches the side of the quadrilateral $ABCD$. If $AB = p$, express $(AD + BC)$ in terms of p and



(a) $p + q$ (b) $\frac{1}{2}p + q$

(c) $2(p - q)$ (d) $3(p - q)$

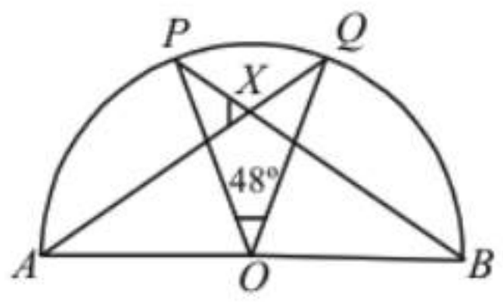
4. In the figure given below, AB is a diametre of the semi-circle $APQB$, centre O, $\angle POQ = 48°$ cuts BP at X, calculate $\angle AXP$.

(a) 50°

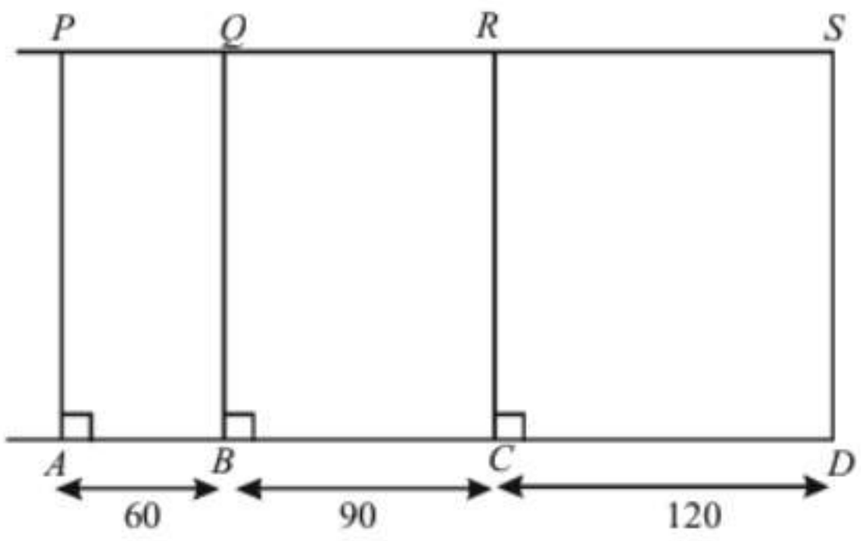
(b) 55°

(c) 66°

(d) 40°



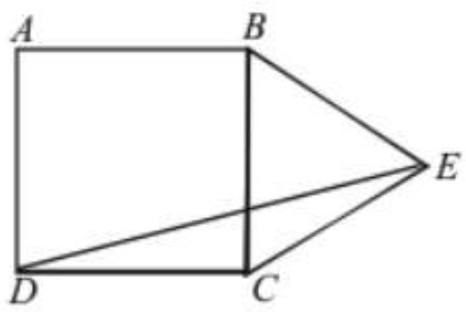
5. In the figure, if $PS = 360$, find PQ, QR and RS.



(a) 150° (b) 160°

(c) 180° (d) 190°

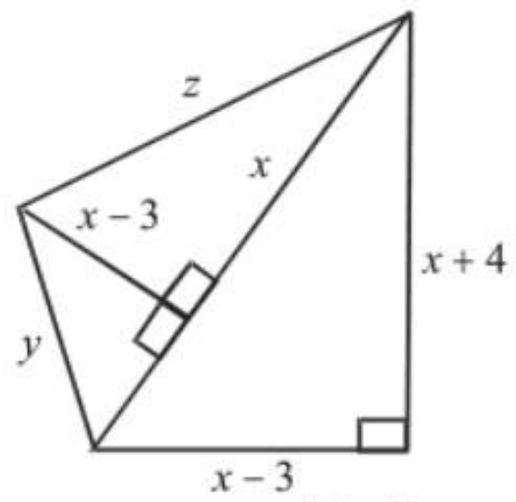
6. If $ABCD$ is a square and BCE is an equilateral triangle, what is the measure of the angle DEC?



(a) 15° (b) 30°

(c) 20° (d) 45°

7. Based on the figure below, what is the value of x, if $y = 10$

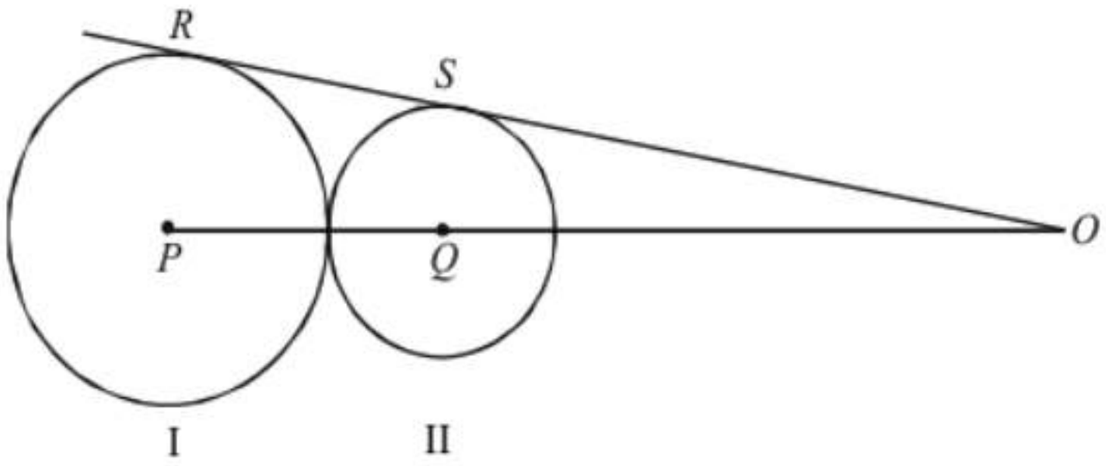


(a) 10 (b) 11

(c) 12 (d) None of these

DIRECTIONS (Qs. 8–10) : ***Answer the questions on the basis of the information given below.***

In the adjoining figure, I and II are circles with centers P and Q respectively. The two circle touch each other and have a common tangent that touches them at points R and S respectively. This common tangent meets the line joining P and Q at O. The diameters of I and II are in the rartio 4 : 3. It is also known that the length of PO is 28 cm.

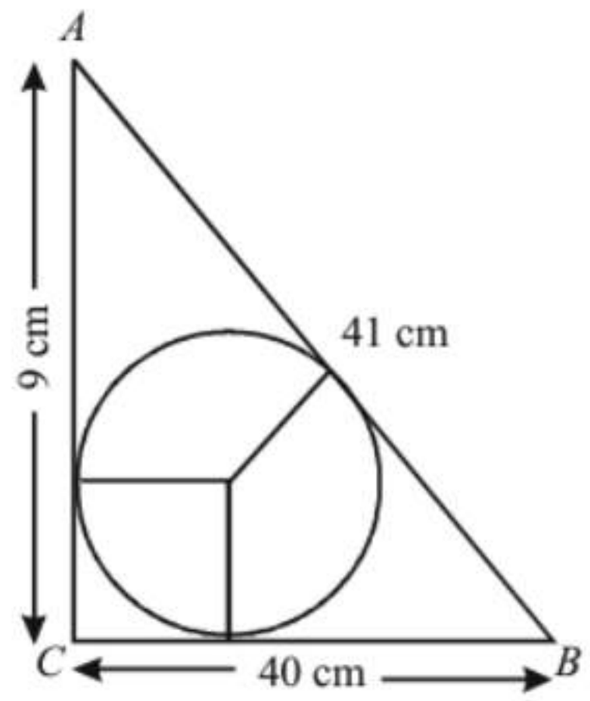


8. What is the ratio of the length of PQ to that of QO?
(a) 1 : 4 (b) 1 : 3
(c) 3 : 8 (d) 3 : 4

9. What is the radius of the circle II?
(a) 2 cm (b) 3 cm
(c) 4 cm (d) 5 cm

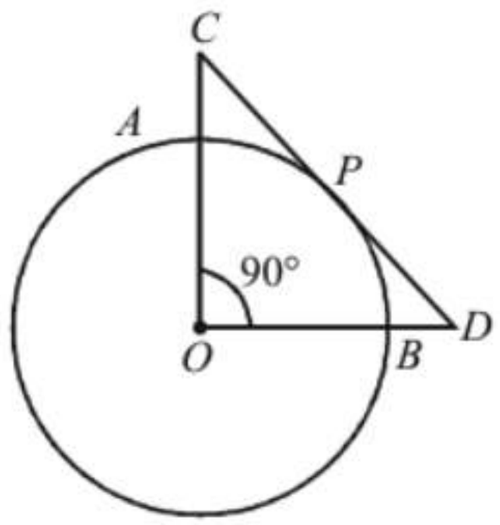
10. The length of SO is
(a) $8\sqrt{3}$ cm (b) $10\sqrt{3}$ cm
(c) $12\sqrt{3}$ cm (d) $14\sqrt{3}$ cm

11. What is the inradius of the incircle shown in the figure?



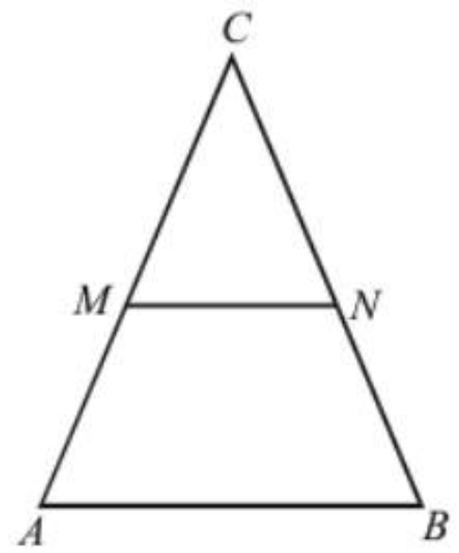
(a) 9 cm (b) 4
(c) can't be determined (d) None of these

12. In a circle O is the centre and $\angle COD$ is right angle. $AC = BD$ and CD is the tangent at P. What is the value of $AC + CP$, if the radius of the circle is 1 metre?



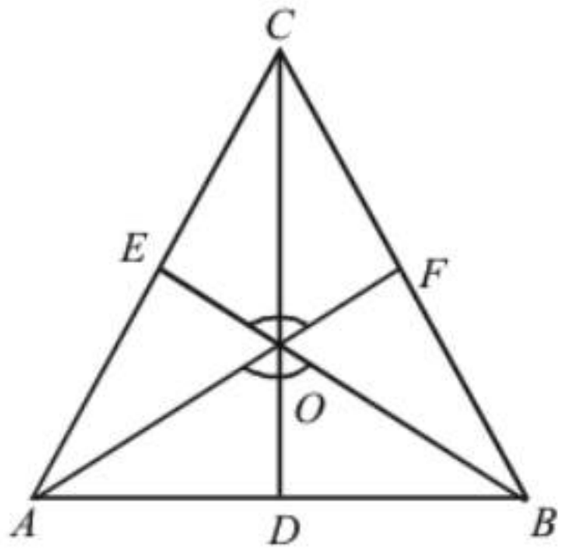
(a) 105 cm (b) 141.4 cm
(c) 138.6 cm (d) can't be determined

13. In the triangle ABC, MN is parallel to AB. Area of trapezium $ABNM$ is twice the area of triangle CMN. What is ratio of $CM : AM$?



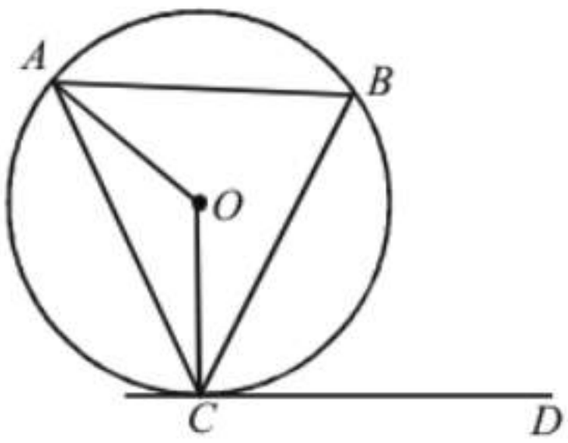
(a) $\frac{1}{\sqrt{3}+1}$ (b) $\frac{\sqrt{3}-1}{2}$
(c) $\frac{\sqrt{3}+1}{2}$ (d) None of these

14. ABC is a triangle in which $\angle CAB = 80°$ and $\angle ABC = 50°$, AE, BF and CD are the altitudes and O is the orthocentre. What is the value of $\angle AOB$?



(a) 65° (b) 70°
(c) 50° (d) 130°

15. In the given diagram O is the centre of the circle and CD is a tangent. $\angle CAB$ and $\angle ACD$ are supplementary to each other $\angle OAC$ 30°. Find the value of $\angle OCB$:



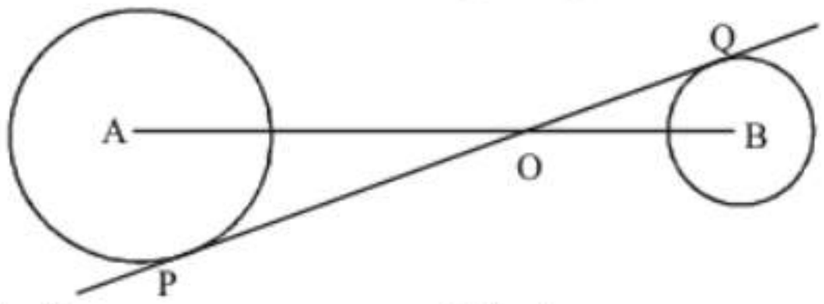
(a) 30° (b) 20°
(c) 60° (d) None of these

16. The sides of a triangle are in the ratio of $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$. If the perimeter is 52 cm, then the length of the smallest side is
(a) 9 cm (b) 10 cm
(c) 11 cm (d) 12 cm

17. The ratio of the area of a square to that of the square drawn on its diagonal is

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

18. PQ is a tangential to circles with centers A and B at P and Q respectively. If AB = 10 cm. and PQ = 8 cm, find the radius of the bigger circle. Given that area of triangle APO is four times the area of triangle OQB –



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

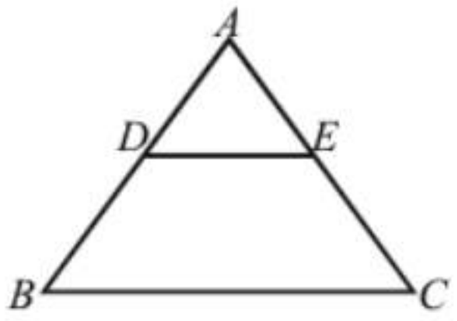
19. Two circles touch each other internally. Their radii are 2 cm and 3 cm. The biggest chord of the outer circle which is outside the inner circle is of length

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

20. The sum of the interior angles of a polygon is 1620°. The number of sides of the polygon are :

(a) 9 (b) 11
(c) 15 (d) 12

21. In ΔABC, $DE \parallel BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If AC = 5.6 cm, find AE.

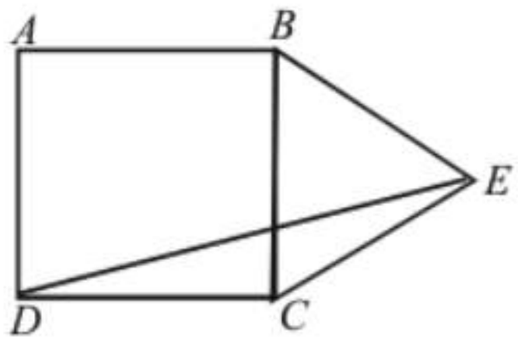


(a) 2.1 cm (b) 3.1 cm
(c) 1.2 cm (d) 2.3 cm

22. If one of the diagonals of a rhombus is equal to its side, then the diagonals of the rhomhus are in the ratio:

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

23. If $ABCD$ is a square and BCE is an equilateral triangle, what is the measure of the angle DEC?



(a) 15° (b) 30°
(c) 20° (d) 45°

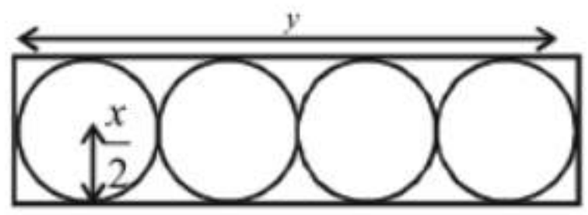
24. $ABCD$ is a square, F is the mid-point of AB and E is a point on BC such that BE is one-third of BC. If area of ΔFBE = 108 m^2, then the length of AC is :

(a) 63 m (b) $36\sqrt{2}$ m
(c) $63\sqrt{2}$ m (d) $72\sqrt{2}$ m

25. Arc ADC is a semicircle and $DB \perp AC$. If AB = 9 and BC = 4, find DB.

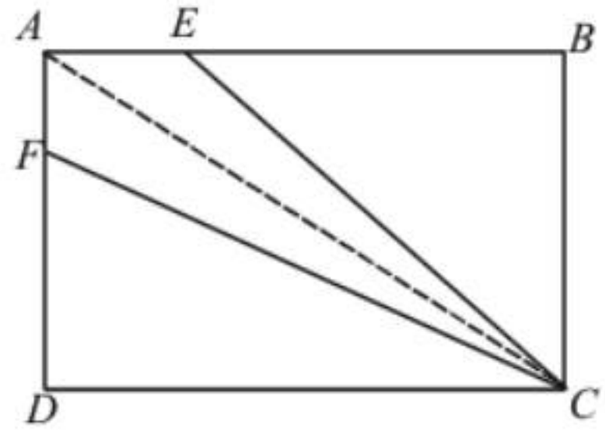
(a) 6 (b) 8
(c) 10 (d) 12

26. In the figure below, which of the following is the relationship between 'x' and 'y' if the equal circles shown are tangents to each other and to the sides of the rectangle



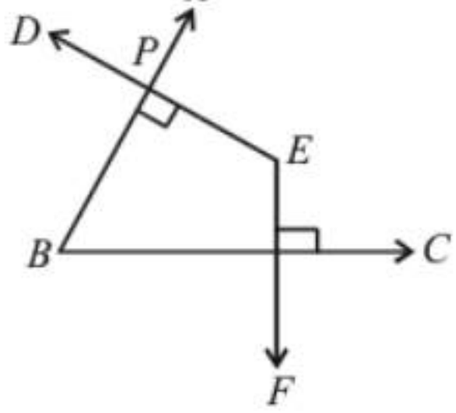
(a) $x = \frac{1}{4}y$ (b) $x = \frac{y}{\pi}$
(c) $x = \pi y^2$ (d) $x = 2\pi y$

27. In the given figure given below, E is the mid-point of AB and F is the midpoint of AD. if the area of $FAEC$ is 13, what is the area of $ABCD$?



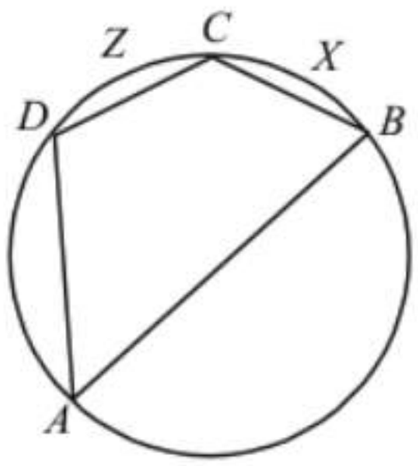
(a) 19.5 (b) 26
(c) 39 (d) None of these

28. In the given figure, $\angle ABC$ and $\angle DEF$ are two angles such that $BA \perp ED$ and $EF \perp BC$, then find value of $\angle ABC + \angle DEF$.



(a) 120° (b) 180°
(c) 150° (d) 210°

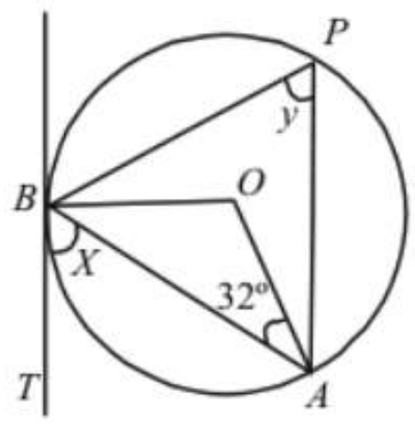
29. In the cyclic quadrilateral $ABCD$ $BCD = 120°$, m (arc DZC) $= 7°$, find DAB and m (arc CXB).



(a) $60°, 70°$ (b) $60°, 40°$

(c) $60°, 50°$ (d) $60°, 60°$

30. In the given figure, AB is chord of the circle with centre O, BT is tangent to the circle. The values of x and y are



(a) $52°, 52°$ (b) $58°, 52°$

(c) $58°, 58°$ (d) $60°, 64°$

31. The distance between two parallel chords of length 8 cm each in a circle of diameter 10 cm is

(a) 6 cm (b) 7 cm

(c) 8 cm (d) 5.5 cm

32. The internal bisectors of the angles B and C of a triangle ABC meet at O. Then find the measure of $\angle BOC$.

(a) $90° - \frac{\angle A}{2}$ (b) $180° - \frac{\angle A}{2}$

(c) $90° + \frac{\angle A}{2}$ (d) $180° + \frac{\angle A}{2}$

33. In a ΔABC, angle C is $68°$, the perpendicular bisector of AB at R meets BC at P. If $\angle PAC = 42°$ then $\angle ABC$ is equal to

(a) $45°$ (b) $42°$

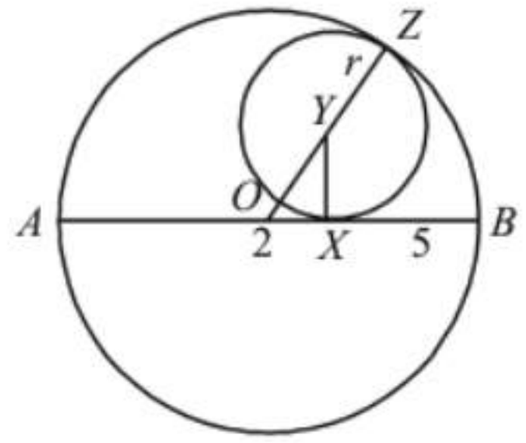
(c) $35°$ (d) $34°$

34. A chord of length 14 cm is at a distance of 6 cm from the centre of a circle. Find the length of another chord at a distance of 2 cm from the centre of the circle.

(a) 18 cm (b) 16 cm

(c) 10 cm (d) 12 cm

35. In the adjoining figure x is a point on diameter AB of the circle with centre o, such that $AX = 9$ cm, $XB = 5$ cm. Find the radius of the circle (centre Y) which touches the diameter at X and touches the circle, centre O, internally at Z.



(a) $3\frac{3}{14}$ cm (b) $3\frac{1}{14}$ cm.

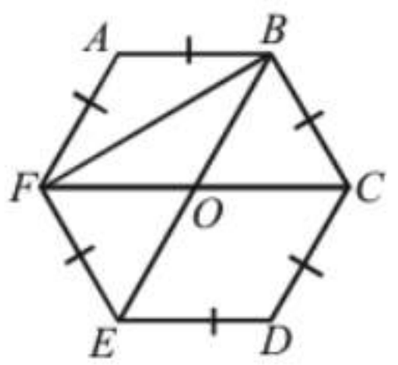
(c) $1\frac{1}{14}$ cm. (d) $2\frac{3}{14}$ cm.

36. In ΔABC, $AB = AC = 8$, PR and PQ are parallel to lines AC and AB respectively. P is the midpoint of BC. Find the perimeter of $\square PRAQ$.

(a) 16 (b) 18

(c) 20 (d) 12

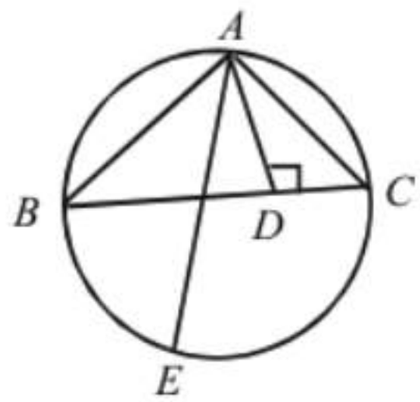
37. The height of the hexagon whose side is a



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

(c) $\sqrt{3}\,a$ (d) None of these

38. In ΔABC, $AB = 8$, $AC = 6$, Altitude $AD = 4.8$ AE is the diameter of the circumcircle. Find the circumradius.



(a) 5 (b) 10

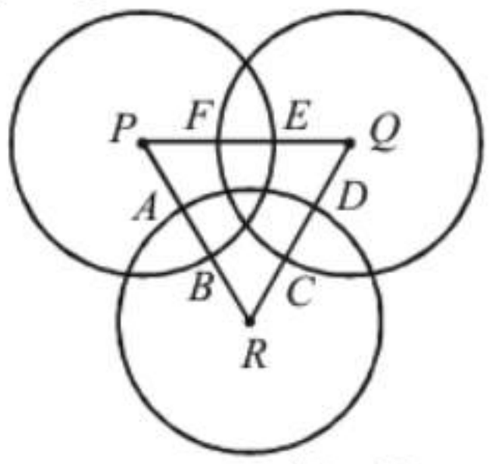
(c) 15 (d) Cannot be determined

39. The length of a ladder is exactly equal to the height of the wall it is resting against. If lower end of the ladder is kept on a stool of height 3 m and the stool is kept 9 m away from the wall the upper end of the ladder coincides with the tip of the wall. Then, the height of the wall is

(a) 12 m. (b) 15 m.

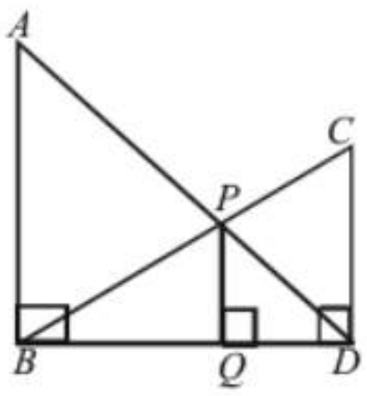
(c) 18 m. (d) 11 m.

40. Three circles, each of radius 20 and centres at P, Q, R. further, $AB = 5$, $CD = 10$ and $EF = 12$. What is the perimeter of the triangle PQR?



(a) 120 (b) 66
(c) 93 (d) 87

41. In the diagram given below, $\angle ABD = \angle CDB = \angle PQD = 90°$. If $AB : CD = 3 : 1$, the ratio of $CD : PQ$ is

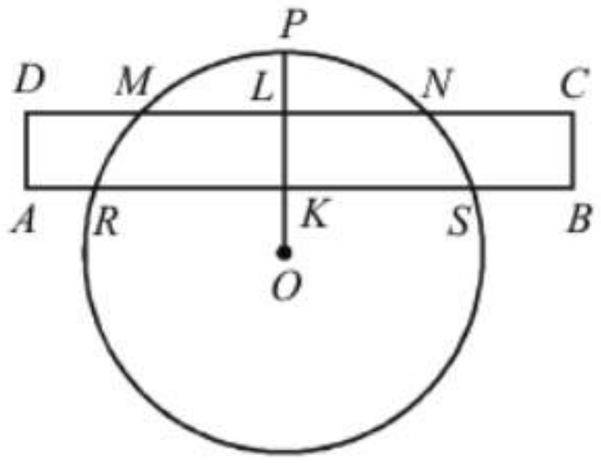


(a) 1 : 0.69 (b) 1 : 0.75
(c) 1 : 072 (d) None of these

42. What is the distance in cm between two parallel chords of lengths 32 cm and 24 cm in a circle of radius 20 cm?

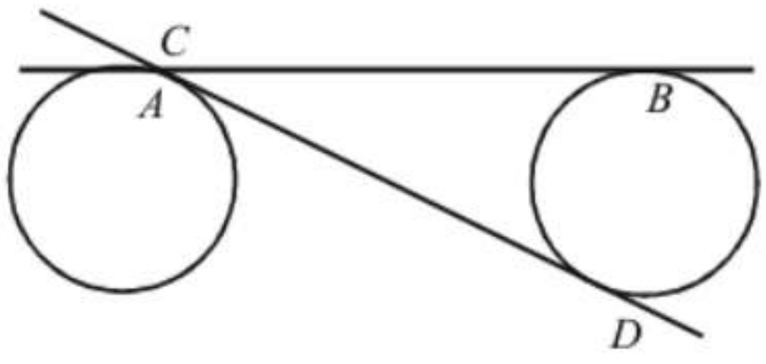
(a) 1 or 7 (b) 2 or 14
(c) 3 or 21 (d) 4 or 28

43. In the adjoining figure O is the centre of the circle. The radius OP bisects a rectangle $ABCD$, at right angle. $DM = NC = 2$ cm and $AR = SB = 1$ cm and $KS = 4$ cm and $OP = 5$ cm. What is the area of the rectangle?



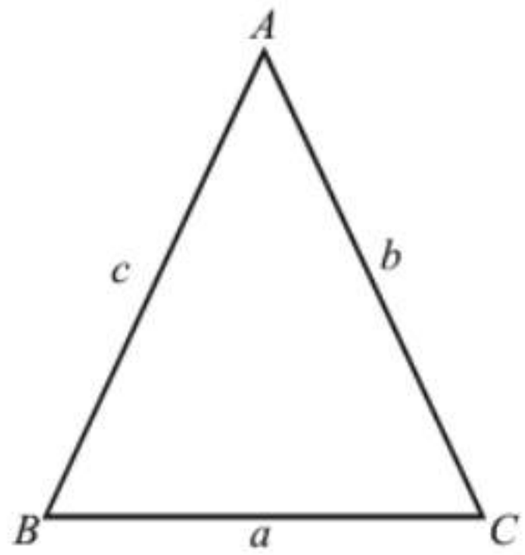
(a) 8 cm^2 (b) 10 cm^2
(c) 12 cm^2 (d) None of these

44. There are two circles each with radius 5 cm. Tangent AB is 26 cm. The length of tangent CD is:



(a) 15 cm (b) 21 cm
(c) 24 cm (d) can't be determined

45. In the given triangle ABC, the length of sides AB and AC is same (i.e., $b = c$) and $60° < A < 90°$, then the possible length of BC is



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

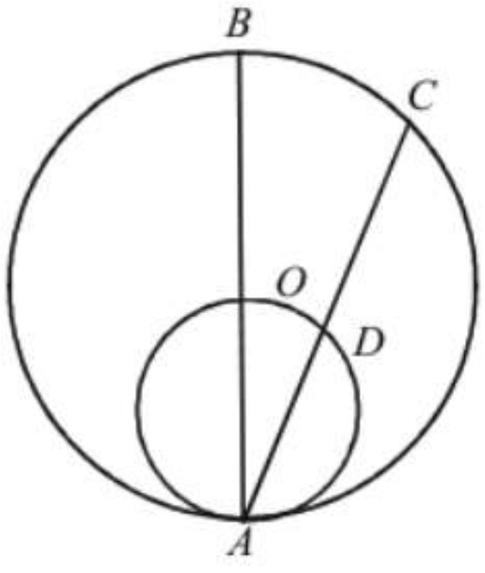
46. The angles of a triangle are in the ratio of 4 : 1 : 1. Then the ratio of sine of the largest angle to the smallest angle is the largest side to the perimeter is
[sin 120° = sin 60°]

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

47. What is the sum of all the angles of a 9 pointed star (i.e., $\angle 1 + \angle 2 + \angle 3 + ... \angle 8 + \angle 9$):

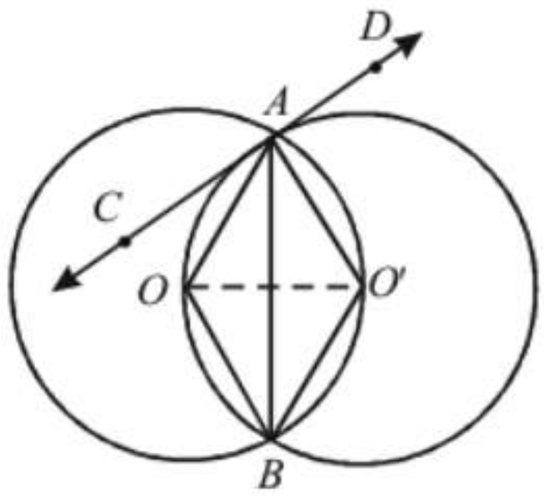
(a) 909° (b) 900°
(c) 720° (d) 540°

48. A smaller circle touches internally to a larger circle at A and passes through the centre of the larger circle. O is the centre of the larger circle and BA, OA are of the diameters of the larger and smaller circles respectively. Chord AC intersects the smaller circle at a point D. If $AC = 12$ cm, then AD is:



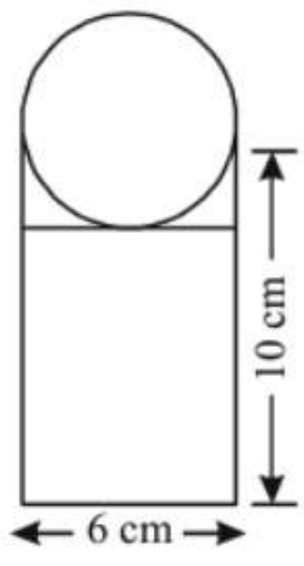
(a) 4 cm (b) 6 cm
(c) 5.6 cm (d) Data insufficient

49. Two circles $C(O, r)$ and $C(O', r')$ intersect at two points A and B and O lies on $C(O', r')$. A tangent CD is drawn to the circle $C(O', r')$ at A. Then



(a) $\angle OAC = \angle OAB$ (b) $\angle OAB = \angle AO'O$
(c) $\angle AO'B = \angle AOB$ (d) $\angle OAC = \angle AOB$

50. Find the perimeter of the given figure.



(a) $(32 + 3\pi)$ cm (b) $(36 + 6\pi)$ cm
(c) $(46 + 3\pi)$ cm (d) $(26 + 3\pi)$ cm

51. ΔABC has sides AB, AC measuring 2001 and 1002 units respectively. How many such triangles are possible with all integral sides?
(a) 2001 (b) 1002
(c) 2003 (d) 1004

52. One of the angles of a quadrilateral is thrice the smaller angle of a parallelogram. The respective ratio between the adjacent angles of the parallelogram is 4:5. Remaining three angles of the quadrilateral are in ratio 4 : 11: 9 respectively. What is the sum of the largest and the smallest angles of the quadrilateral? [*IBPS-PO-2013*]
(a) 255° (b) 260°
(c) 265° (d) 270°
(e) None of these

53. Two circles intersect each other at P and Q. PA and PB are two diameters. Then $\angle AQB$ is [*SSC CGL-2012*]
(a) 120° (b) 135°
(c) 160° (d) 180°

54. O is the centre of the circle passing through the points A, B and C such that $\angle BAO = 30°$, $\angle BCO = 40°$ and $\angle AOC =$ x°. What is the value of x ? [*SSC CGL-2012*]
(a) 70° (b) 140°
(c) 210° (d) 280°

55. A and B are centres of the two circles whose radii are 5 cm and 2 cm respectively. The direct common tangents to the circles meet AB extended at P. Then P divides AB. [*SSC CGL-2012*]
(a) externally in the ratio 5 : 2
(b) internally in the ratio 2 : 5
(c) internally in the ratio 5 : 2
(d) externally in the ratio 7 : 2

56. A, B, P are three points on a circle having centre O. If $\angle OAP = 25°$ and $\angle OBP = 35°$, then the measure of $\angle AOB$ is [*SSC CGL-2013*]
(a) 120° (b) 60°
(c) 75° (d) 150°

57. Side $\overline{BC}$ of ΔABC is produced to D. If $\angle ACD = 140°$ and $\angle ABC = 3\angle BAC$, then find $\angle A$. [*SSC CGL-2013*]
(a) 55° (b) 45°
(c) 40° (d) 35°

58. The length of tangent (upto the point of contact) drawn from an external point P to a circle of radius 5 cm is 12 cm. The distance of P from the centre of the circle is [*SSC CGL-2013*]
(a) 11 cm (b) 12 cm
(c) 13 cm (d) 14 cm

59. ABCD is a cyclic quadrilateral, AB is a diameter of the circle. If $\angle ACD = 50°$, the value of $\angle BAD$ is [*SSC CGL-2013*]
(a) 30° (b) 40°
(c) 50° (d) 60°

60. Two circles of equal radii touch externally at a point P. From a point T on the tangent at P, tangents TQ and TR are drawn to the circles with points of contact Q and R respectively. The relation of TQ and TR is [*SSC CGL-2013*]
(a) TQ < TR (b) TQ > TR
(c) TQ = 2TR (d) TQ = TR

61. When two circles touch externally, the number of common tangents are [*SSC CGL-2013*]
(a) 4 (b) 3
(c) 2 (d) 1

62. D and E are the mid-points of AB and AC of ΔABC. If $\angle A = 80°$, $\angle C = 35°$, then $\angle EDB$ is equal to [*SSC CGL-2013*]
(a) 100° (b) 115°
(c) 120° (d) 125°