EduSahara™ Assignment

Name : Circles - Tangent Properties

Chapter : Tangent Properties of Circles

Grade : ICSE Grade X

1. If 'l' is the length of the tangent drawn to a circle with radius 'r' from point 'P' which is 'd' cm away from the centre, then

   (i) $l=\sqrt{(d^2-r^2)}$ (ii) $d=\sqrt{(l^2+r^2)}$ (iii) $r=\sqrt{(l^2+d^2)}$ (iv) $l=\sqrt{(d^2+r^2)}$ (v) $d=\sqrt{(l^2-r^2)}$

2. Two circles with radii R and r touch internally. If the distance between their centres is d, then

   (i) d = R - r (ii) d > R - r (iii) d < R - r (iv) d = R + r (v) d < R + r

3. The distance between the centres of two circles is d.
   If the radii are r_1 and r_2, the length of their transverse common tangent is

   (i) $\sqrt{d^2+(r_1+r_2)^2}$ (ii) $\sqrt{d^2-(r_1+r_2)^2}$ (iii) $\sqrt{d^2-(r_1-r_2)^2}$ (iv) $\sqrt{d^2+(r_1-r_2)^2}$ (v) None of these

4. The distance between the centres of two circles is d.
   If the radii are r_1 and r_2, the length of their direct common tangent is

   (i) None of these (ii) $\sqrt{d^2-(r_1+r_2)^2}$ (iii) $\sqrt{d^2-(r_1-r_2)^2}$ (iv) $\sqrt{d^2+(r_1-r_2)^2}$ (v) $\sqrt{d^2+(r_1+r_2)^2}$

5. Two circles with equal radii are

   (i) not similar (ii) congruent (iii) only similar but not congruent (iv) concentric

6. The angle between a tangent to a circle and the radius drawn at the point of contact is

   (i) 90° (ii) 95° (iii) 100° (iv) 105° (v) 120°

7. If two circles of radii 10 cm and 4 cm touch internally, the distance between their centres is

   (i) 4 cm (ii) 7 cm (iii) 8 cm (iv) 5 cm (v) 6 cm

8. If two circles of radii 13 cm and 7 cm touch externally, the distance between their centres is

   (i) 20 cm (ii) 21 cm (iii) 19 cm (iv) 22 cm (v) 18 cm

9. If two circles touch internally, the number of their common tangents is

   (i) 2 (ii) 0 (iii) 1 (iv) 4 (v) (-1)

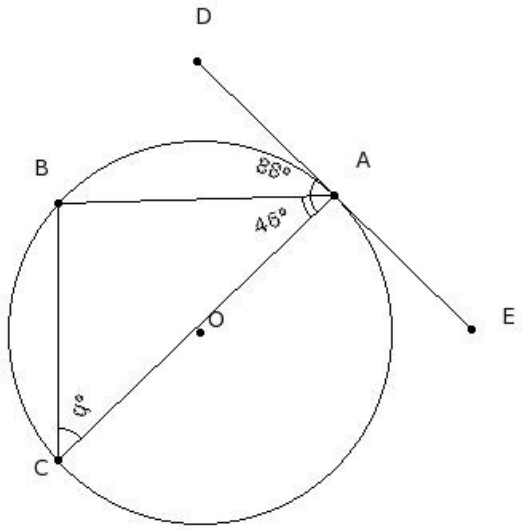
10. If two circles intersect, the number of their common tangents is

    (i) 1 (ii) 3 (iii) 5 (iv) 0 (v) 2

11. If two circles touch externally, the number of their common tangents is

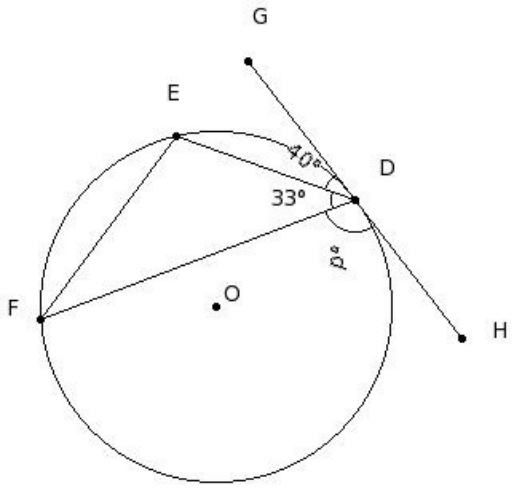
    (i) 4 (ii) 2 (iii) 5 (iv) 3 (v) 1

12. In the given figure, O is the centre of the circle and DE is the tangent at A. If ∠BAC = 46° and ∠DAB = 88°, find ∠ACB



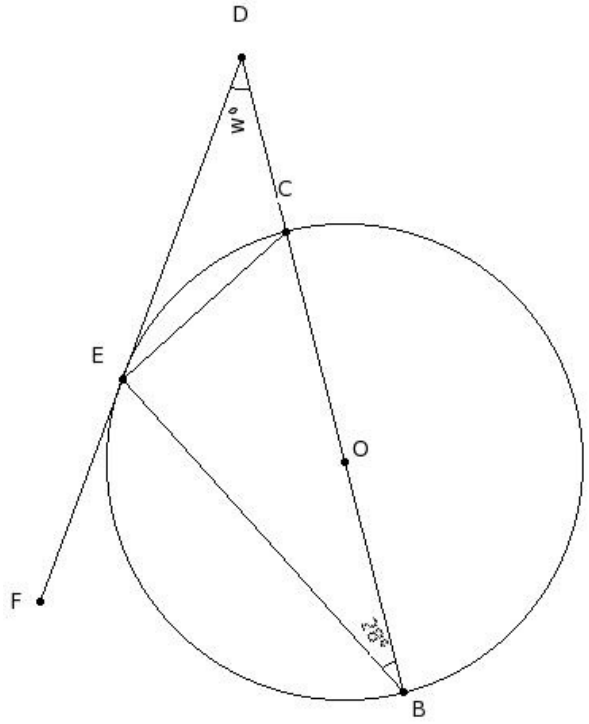
(i) 47° (ii) 72° (iii) 52° (iv) 42° (v) 57°

13. In the given figure, O is the centre of the circle and GH is the tangent at D. If ∠EDF = 33° and ∠GDE = 40°, find ∠FDH



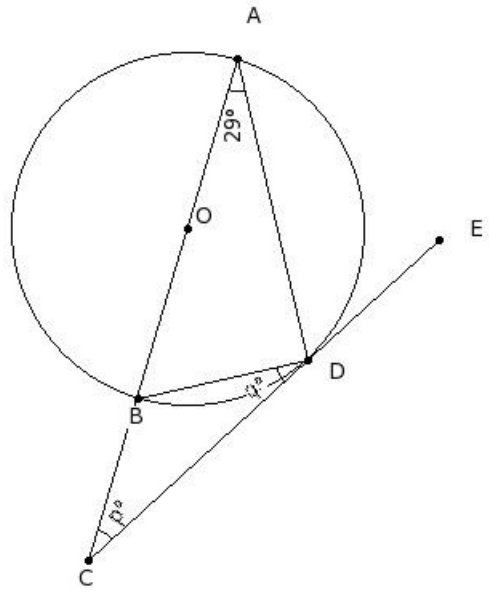
(i) 112° (ii) 117° (iii) 107° (iv) 122° (v) 137°

14. In the given figure, O is the centre of the circle and DF is the tangent at E . If ∠CBE = 28°, find ∠CDE



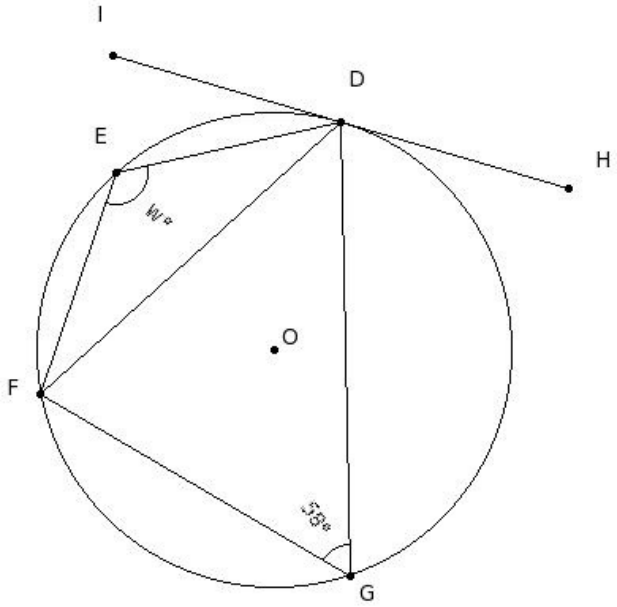
(i) 49° (ii) 64° (iii) 44° (iv) 34° (v) 39°

15. In the given figure, O is the centre of the circle and CE is the tangent at D. If ∠BAD = 29°, find ∠BCD + ∠BDC



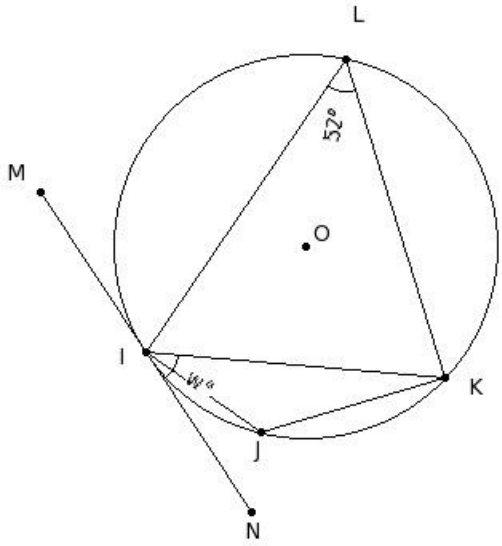
(i) 91° (ii) 71° (iii) 66° (iv) 61° (v) 76°

16. In the given figure, O is the centre of the circle and HI is the tangent at D. If ∠DGF = 58°, find ∠DEF



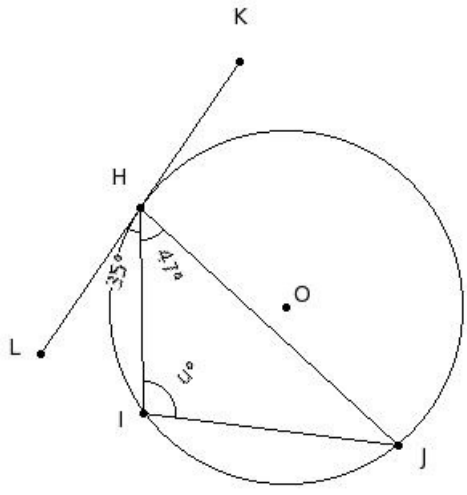
(i) 122° (ii) 137° (iii) 127° (iv) 152° (v) 132°

17. In the given figure, O is the centre of the circle and MN is the tangent at I. If ∠ILK = 52°, find ∠NIK



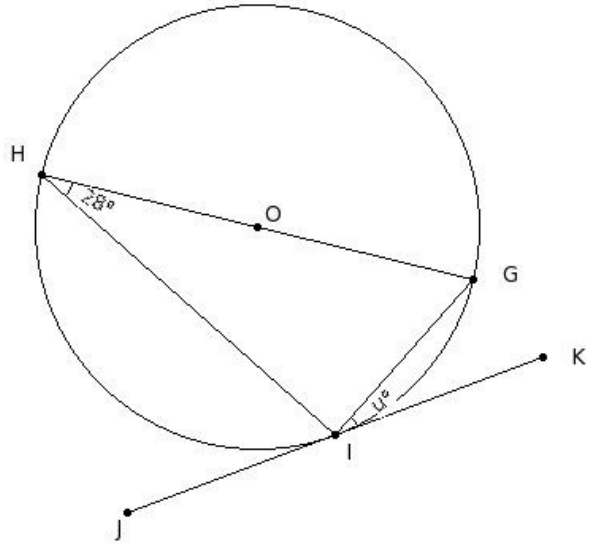
(i) 52° (ii) 82° (iii) 62° (iv) 57° (v) 67°

18. In the given figure, O is the centre of the circle and KL is the tangent at H. If ∠JHI = 47° and ∠IHL = 35°, find ∠JIH



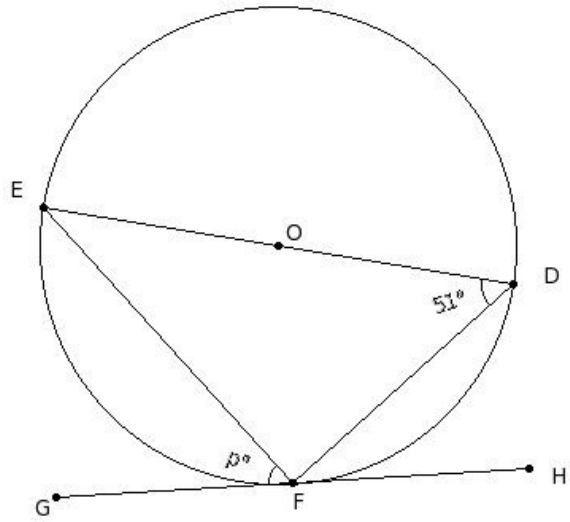
(i) 98° (ii) 128° (iii) 103° (iv) 113° (v) 108°

19. In the given figure, O is the centre of the circle and JK is the tangent at I. If ∠IHG = 28°, find ∠KIG



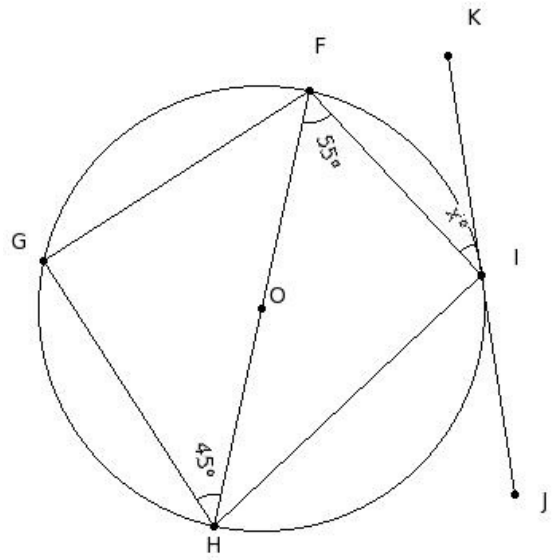
(i) 33° (ii) 28° (iii) 43° (iv) 58° (v) 38°

20. In the given figure, O is the centre of the circle and GH is the tangent at F. If ∠FDE = 51°, find ∠GFE



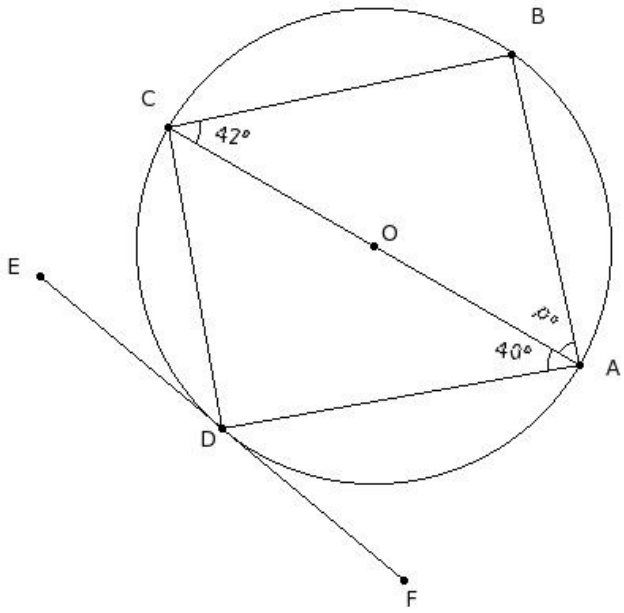
(i) 56° (ii) 61° (iii) 51° (iv) 66° (v) 81°

21. In the given figure, O is the centre of the circle and JK is the tangent at I. If ∠HFI = 55° and ∠FHG = 45°, find ∠KIF



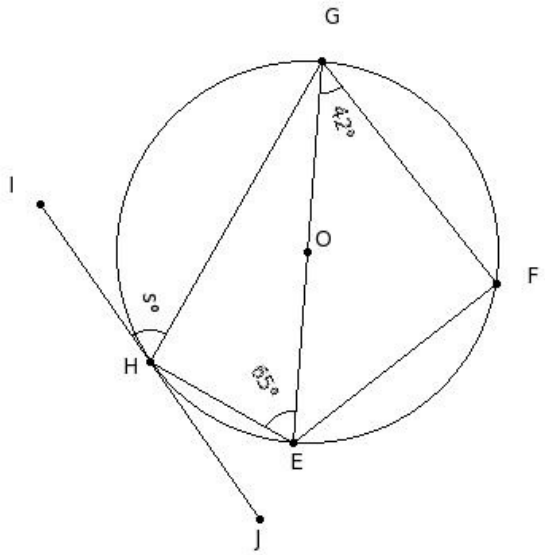
(i) 35° (ii) 40° (iii) 45° (iv) 50° (v) 65°

22. In the given figure, O is the centre of the circle and EF is the tangent at D. If ∠CAD = 40° and ∠ACB = 42°, find ∠CAB



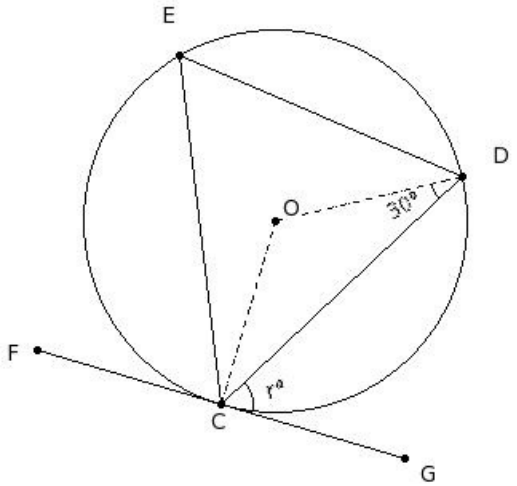
(i) 48° (ii) 78° (iii) 63° (iv) 53° (v) 58°

23. In the given figure, O is the centre of the circle and IJ is the tangent at H. If ∠GEH = 65° and ∠EGF = 42°, find ∠IHG



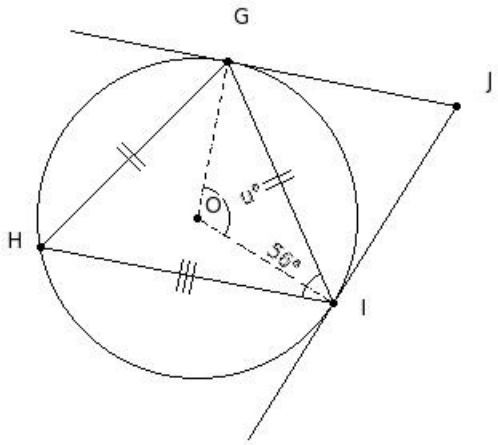
(i) 75° (ii) 95° (iii) 80° (iv) 70° (v) 65°

24. In the given figure, O is the centre of the circle and FG is the tangent at C. If ∠ODC = 30°, find ∠GCD



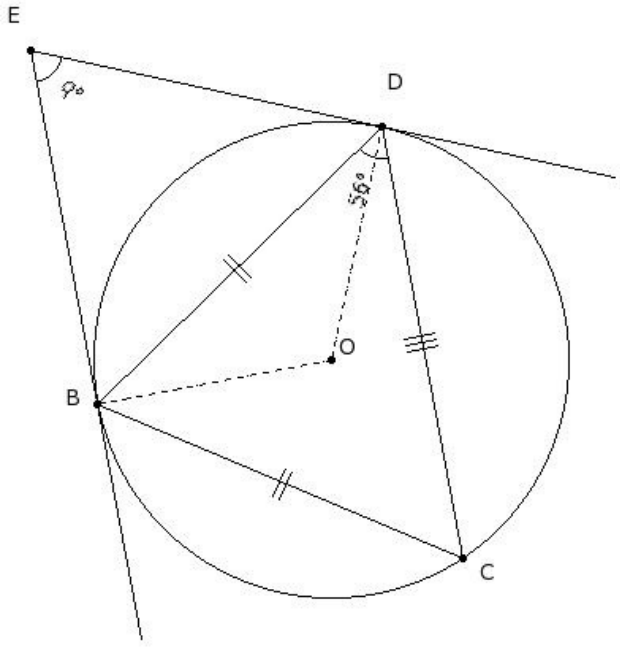
(i) 60° (ii) 70° (iii) 65° (iv) 75° (v) 90°

25. In the given figure, O is the centre of the circle and the tangents GJ and IJ meet at point J. If ∠HIG = 56°, find ∠GOI



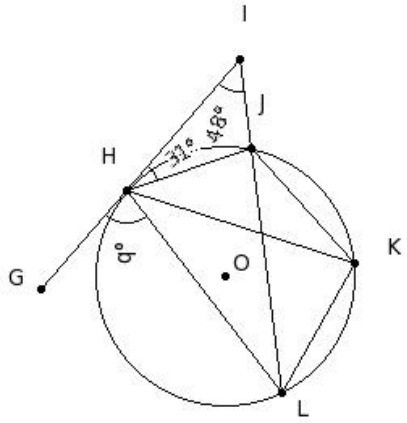
(i) 142° (ii) 117° (iii) 127° (iv) 122° (v) 112°

26. In the given figure, O is the centre of the circle and the tangents BE and DE meet at point E. If ∠CDB = 56°, find ∠DEB



(i) 68° (ii) 83° (iii) 73° (iv) 78° (v) 98°

27. In the given figure, O is the centre of the circle and GI is the tangent at H. If ∠HIJ = 48°,∠IHJ = 31°, find ∠LHG



(i) 84° (ii) 94° (iii) 89° (iv) 109° (v) 79°

28. Which of the following statements are true?

a) Every circle has a unique diameter.
b) One and only one tangent can be drawn to a circle from a point outside it.
c) An infinite number of diameters may be drawn for a circle.
d) An infinite number of chords may be drawn for a circle.
e) Two semi-circles of a circle together make the whole circle.

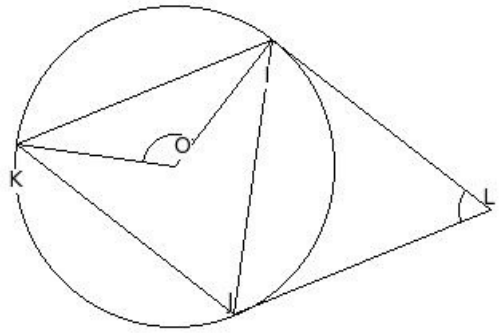
(i) {b,d} (ii) {a,b,e} (iii) {a,c} (iv) {c,d,e} (v) {a,c,d}

29. Which of the following statements are true?

a) One and only one tangent can be drawn to pass through a point on a circle.
b) Every circle has a unique diameter.
c) A secant of a circle is a segment having its end points on the circle.
d) Diameter of a circle is a part of the semi-circle of the circle.
e) One and only one tangent can be drawn to a circle from a point outside it.

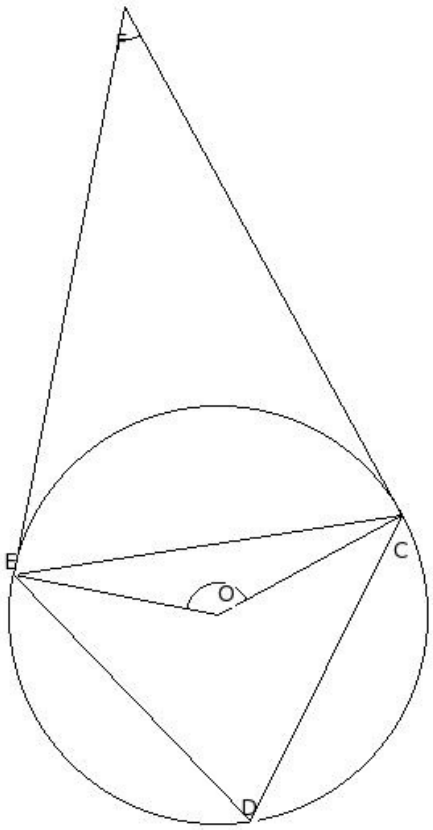
(i) {a,d} (ii) {c,d} (iii) {e,b,a} (iv) {b,a} (v) {c,d,a}

30. O is the centre of the circumcircle of △IJK. Tangents at I and J intersect at L. If ∠ILJ = 59.71° and ∠IOK = 120°, find ∠KIJ



(i) 89.86° (ii) 69.86° (iii) 64.86° (iv) 74.86° (v) 59.86°

31. O is the centre of the circumcircle of △CDE. Tangents at C and E intersect at F. If ∠CFE = 39.62°, find ∠EDC



(i) 70.19° (ii) 100.19° (iii) 75.19° (iv) 85.19° (v) 80.19°

32. A line which intersects the circle at two distinct points is called a

(i) tangent (ii) chord (iii) segment (iv) secant (v) centre

33. A line which touches a circle at only one point is called a

(i) segment (ii) quadrant (iii) chord (iv) tangent (v) secant

34. If the two radii OP and OQ of a circle are at right angles to each other, then the sector OPQ is called a

(i) chord (ii) quadrant (iii) circumference (iv) secant (v) major segment

35. Which of the following statements are true?

a) A maximum of four common tangents can be drawn touching any two circles.
b) Atmost three common tangents can be drawn touching two circles which touch each other.
c) Atmost one common tangent can be drawn for any two concentric circles.
d) Atmost two common tangents can be drawn touching any two circles.

(i) {c,d,a} (ii) {c,a} (iii) {c,b,a} (iv) {d,b} (v) {a,b}

36. Which of the following statements are true?

a) A secant has two end points.
b) A tangent is the limiting case of a secant.
c) A secant and a chord are same.
d) A radius is a limiting case of a diameter.
e) A diameter is a limiting case of a chord.

(i) {a,b} (ii) {d,a,b} (iii) {c,e,b} (iv) {b,e} (v) {c,e}

37. Which of the following statements are true?

a) The sides of a triangle can be tangents to a circle.
b) Two tangents to a circle always intersect.
c) Atmost one tangent can be drawn through a point inside the circle.
d) Only two tangents can be drawn from a point outside the circle.
e) Only one tangent can be drawn through a point on a circle.

(i) {b,a,d} (ii) {b,a} (iii) {a,d,e} (iv) {c,d} (v) {b,c,e}

38. Which of the following statements are true?

a) If two tangents are parallel, the distance between them is equal to the diameter of the circle.
b) A line parallel to a tangent is a secant.
c) Two different tangents can meet at a point on the circle.
d) If two tangents are perpendicular, they form a right angled triangle with their points of contact with the circle and their point of intersection.
e) If two tangents to a circle intersect, their points of contact with the circle together with their point of intersection form an isosceles triangle.

(i) {b,a} (ii) {b,c,e} (iii) {a,d,e} (iv) {c,d} (v) {b,a,d}

39. Which of the following statements are true?

a) There exists four common tangents for any two non-intersecting circles.
b) If two circles touch each other internally, there is only one common tangent.
c) If two circles intersect, then two common tangents can be drawn.
d) If two circles touch each other externally, there is only one common tangent.

(i) {d,b} (ii) {a,b,c} (iii) {d,c} (iv) {d,a} (v) {d,a,b}

40. Which of the following statements are true?

a) If two circles touch externally, the square of the distance between their centres is the sum of the squares of their radii.
b) If two circles touch internally, their centres and the point of contact form a scalene triangle.
c) If two circles touch externally, their centres and the point of contact form an isosceles triangle.
d) If two circles touch internally, the distance between their centres is the difference of their radii.
e) If two circles touch internally, the square of the distance between their centres is the difference of the squares of their radii.
f) If two circles touch externally, the distance between their centres is the sum of their radii.

(i) {a,f,d} (ii) {d,f} (iii) {c,e,d} (iv) {b,f} (v) {a,d}

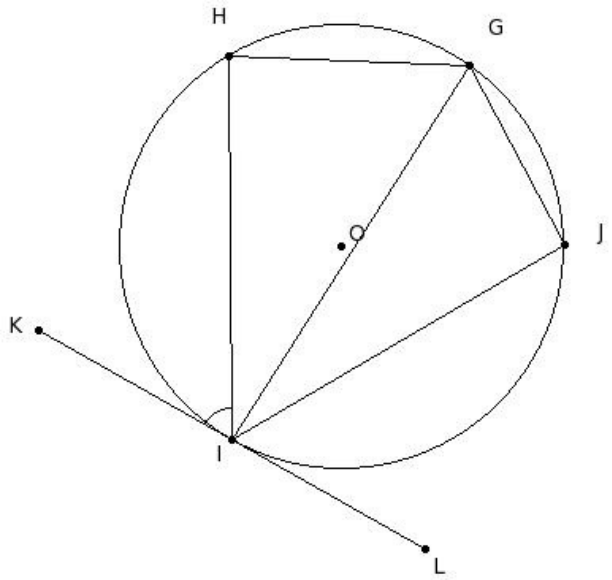
41. Two circles are of radii 6 cm and 5 cm. If the distance between their centres is 15 cm, what is the length of their direct common tangent?

(i) 12.97 cm (ii) 16.97 cm (iii) 15.97 cm (iv) 13.97 cm (v) 14.97 cm

42. Two circles are of radii 2 cm and 1 cm. If the distance between their centres is 6 cm, what is the length of their transverse common tangent?

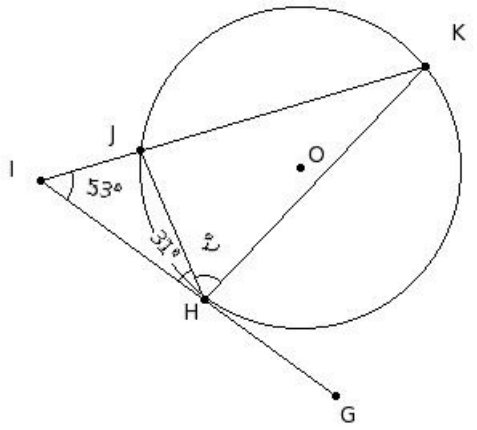
(i) 6.20 cm (ii) 3.20 cm (iii) 4.20 cm (iv) 5.20 cm (v) 7.20 cm

43. In the given figure, GHIJ is a cyclic quadrilateral such that IG bisects ∠JGH and KL is the tangent at I. If ∠IGH = 60°, find ∠KIH



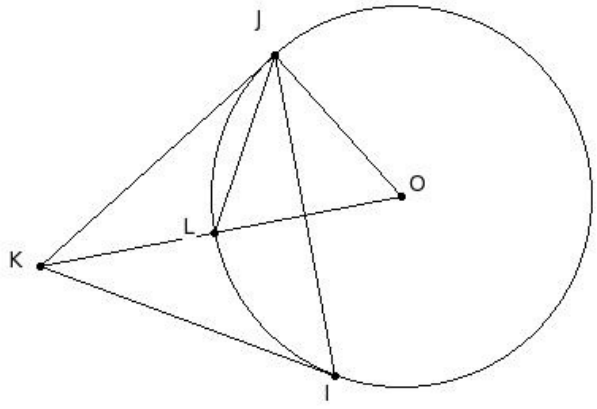
(i) 65° (ii) 75° (iii) 60° (iv) 70° (v) 90°

44. In the given figure, O is the centre of the circle and GI is the tangent at H. If ∠HIJ = 53°,∠IHJ = 31°, find ∠KHJ



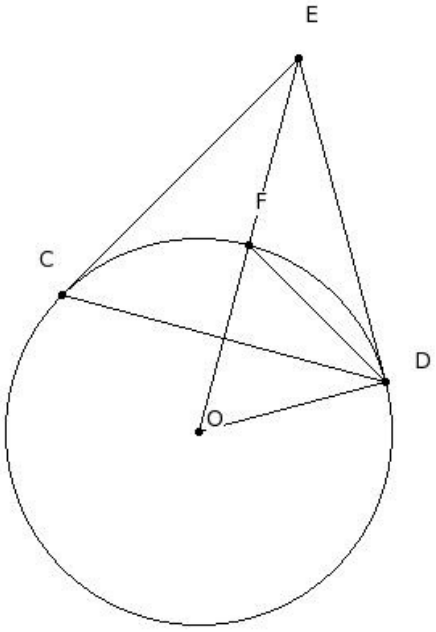
(i) 70° (ii) 80° (iii) 95° (iv) 65° (v) 75°

45. In the given figure, KI and KJ are tangent segments to the circle with centre O. Given ∠JKL = 31°, find ∠IJO



(i) 61° (ii) 31° (iii) 36° (iv) 41° (v) 46°

46. In the given figure, EC and ED are tangent segments to the circle with centre O. Given ∠DEF = 30°, find ∠CDF



(i) 45° (ii) 60° (iii) 40° (iv) 35° (v) 30°

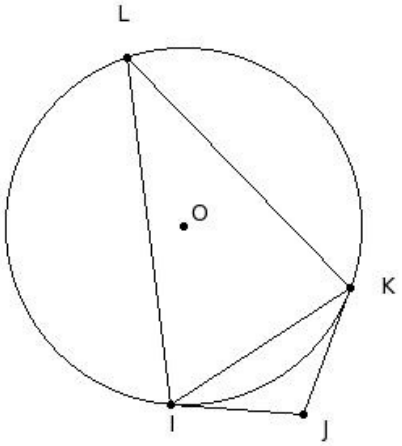
47. With the vertices of a triangle △CDE as centres, three circles are drawn touching each other externally. If the sides of the triangle are 8 cm , 14 cm and 10 cm , find the radii of the circles

(i) 2 cm , 6 cm & 8 cm respectively (ii) 2 cm , 6 cm & 13 cm respectively

(iii) 7 cm , 11 cm & 13 cm respectively (iv) 2 cm , 11 cm & 8 cm respectively

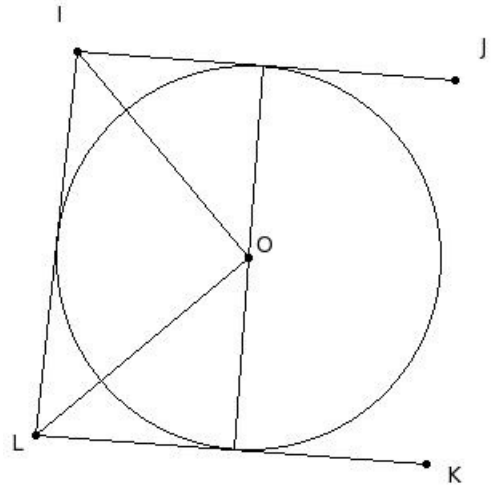
(v) 7 cm , 6 cm & 8 cm respectively

48. O is the centre of the circle. IJ and KJ are tangents to the circle. If ∠KLI = 37°, find ∠IJK



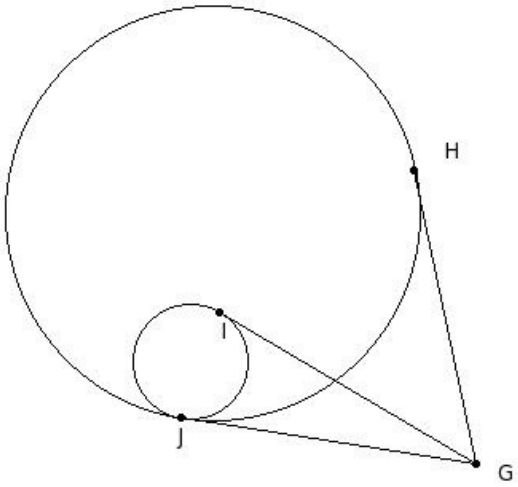
(i) 116° (ii) 136° (iii) 111° (iv) 106° (v) 121°

49. In the given figure, IJ and KL are parallel tangents to the circle with centre O. IL is another tangent meeting IJ and KL at I and L. Find ∠IOL



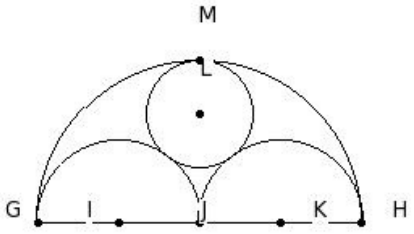
(i) 120° (ii) 95° (iii) 100° (iv) 90° (v) 105°

50. In the given figure, GJ is the common tangent to the two circles. GH & GI are also tangents. Given GH = 19 cm, find GI



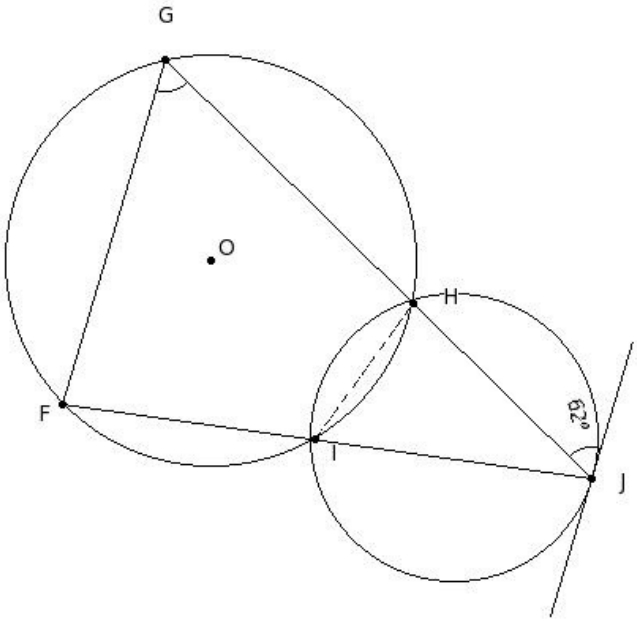
(i) 18 cm (ii) 20 cm (iii) 21 cm (iv) 19 cm (v) 17 cm

51. GH is a line segment and J is its mid-point. Three semi-circles are drawn with GJ , JH and GH as diameters. I , K and J respectively are the centres of these semi-circles. A new circle is drawn touching these three semi-circles. Find its radius, given GI = 5 cm



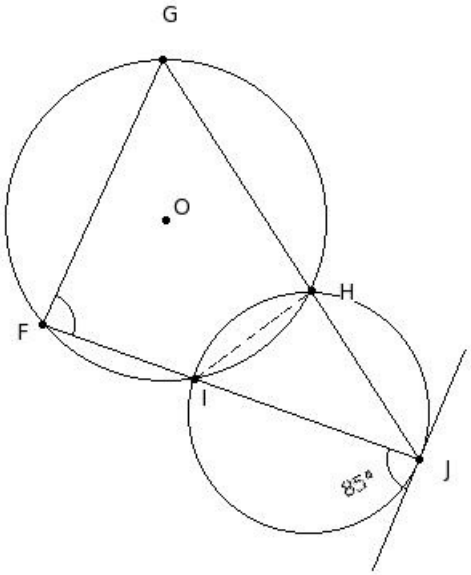
(i) 1.33 cm (ii) 4.33 cm (iii) 5.33 cm (iv) 2.33 cm (v) 3.33 cm

52. In the given figure, two circles intersect at points H & I. A tangent is drawn at point J. From the same point, two lines are drawn passing through points H & I. They meet the other end of the second circle at G & F. Given ∠J = 62°, find ∠FGH



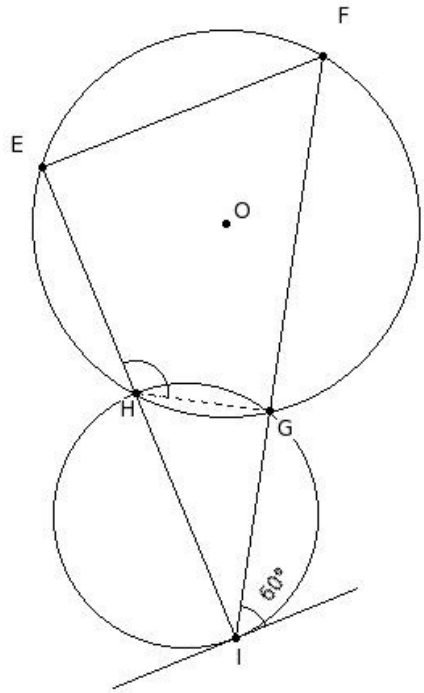
(i) 72° (ii) 77° (iii) 92° (iv) 67° (v) 62°

53. In the given figure, two circles intersect at points H & I. A tangent is drawn at point J. From the same point, two lines are drawn passing through points H & I. They meet the other end of the second circle at G & F. Given ∠J = 85°, find ∠GFI



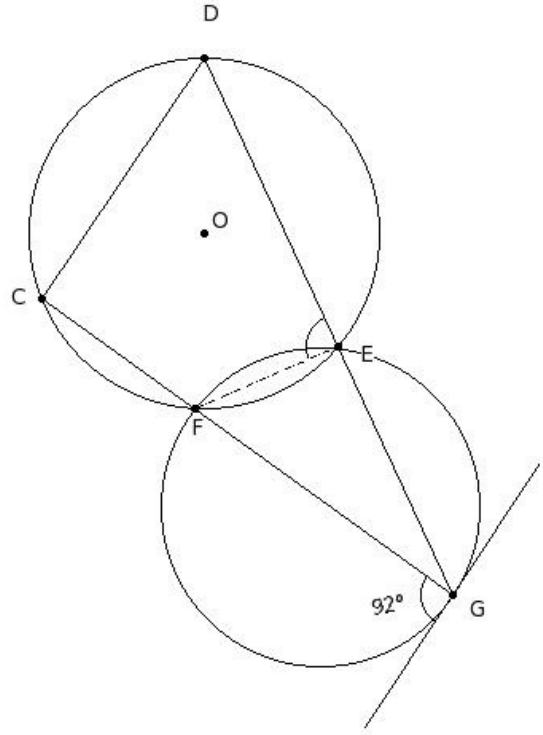
(i) 115° (ii) 85° (iii) 100° (iv) 95° (v) 90°

54. In the given figure, two circles intersect at points G & H. A tangent is drawn at point I. From the same point, two lines are drawn passing through points G & H. They meet the other end of the second circle at F & E. Given ∠I = 60°, find ∠EHG



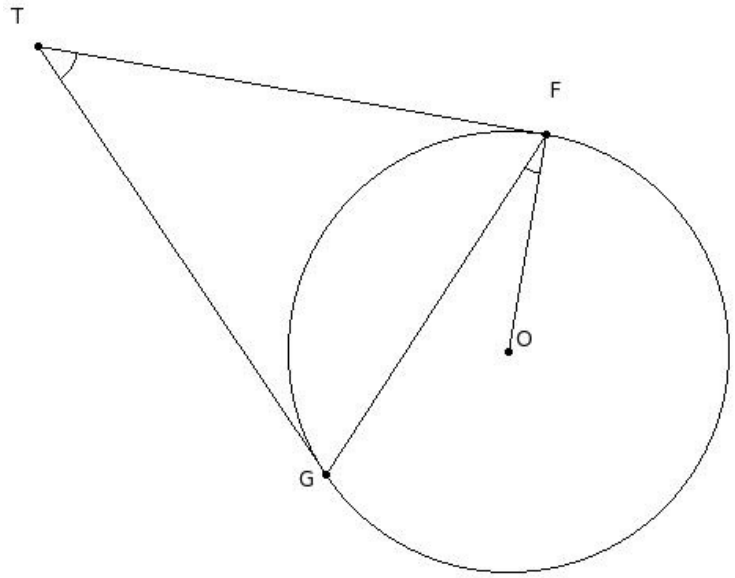
(i) 130° (ii) 135° (iii) 120° (iv) 125° (v) 150°

55. In the given figure, two circles intersect at points E & F. A tangent is drawn at point G. From the same point, two lines are drawn passing through points E & F. They meet the other end of the second circle at D & C. Given ∠G = 92°, find ∠DEF



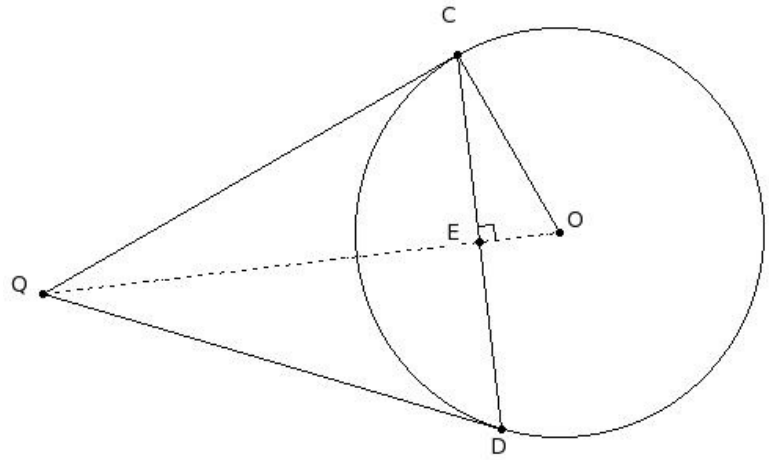
(i) 118° (ii) 93° (iii) 98° (iv) 88° (v) 103°

56. In the given figure, FT & GT are tangents to the circle with centre O. Given ∠T = 46°, find ∠F



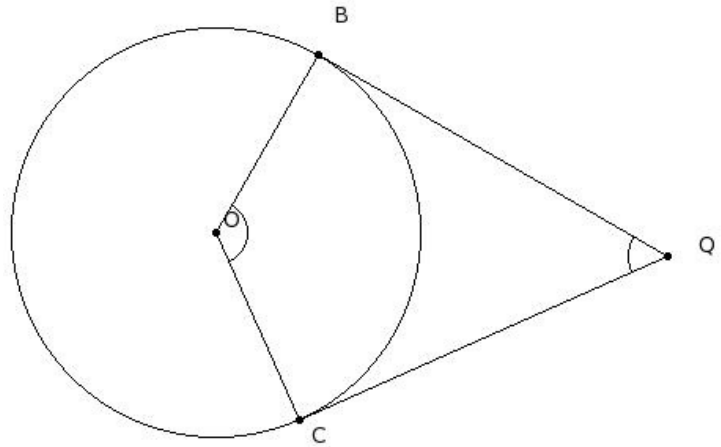
(i) 23° (ii) 33° (iii) 53° (iv) 28° (v) 38°

57. In the given figure, CQ & DQ are tangents to the circle with centre O. Given OC = 13 cm and CD = 24 cm, find CQ



(i) 30.20 cm (ii) 32.20 cm (iii) 29.20 cm (iv) 33.20 cm (v) 31.20 cm

58. In the given figure, BQ & CQ are tangents to the circle with centre O. Given ∠BQC = 54°, find ∠BOC



(i) 126° (ii) 141° (iii) 131° (iv) 136° (v) 156°

Assignment Key

1) (ii)	2) (i)	3) (ii)	4) (iii)	5) (ii)	6) (i)
7) (v)	8) (i)	9) (iii)	10) (v)	11) (iv)	12) (iv)
13) (iii)	14) (iv)	15) (iv)	16) (i)	17) (i)	18) (i)
19) (ii)	20) (iii)	21) (i)	22) (i)	23) (v)	24) (i)
25) (v)	26) (i)	27) (v)	28) (iv)	29) (i)	30) (v)
31) (i)	32) (iv)	33) (iv)	34) (ii)	35) (v)	36) (iv)
37) (iii)	38) (iii)	39) (ii)	40) (ii)	41) (v)	42) (iv)
43) (iii)	44) (iv)	45) (ii)	46) (v)	47) (i)	48) (iv)
49) (iv)	50) (iv)	51) (v)	52) (v)	53) (ii)	54) (iii)
55) (iv)	56) (i)	57) (v)	58) (i)		