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

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) $\sqrt{d^2+(r_1+r_2)^2}$ (ii) None of these (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) concentric (ii) only similar but not congruent (iii) congruent (iv) not similar

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

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

7. If two circles of radii 8 cm and 5 cm touch internally, the distance between their centres is

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

8. If two circles of radii 14 cm and 3 cm touch externally, the distance between their centres is

   (i) 19 cm (ii) 15 cm (iii) 18 cm (iv) 17 cm (v) 16 cm

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

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

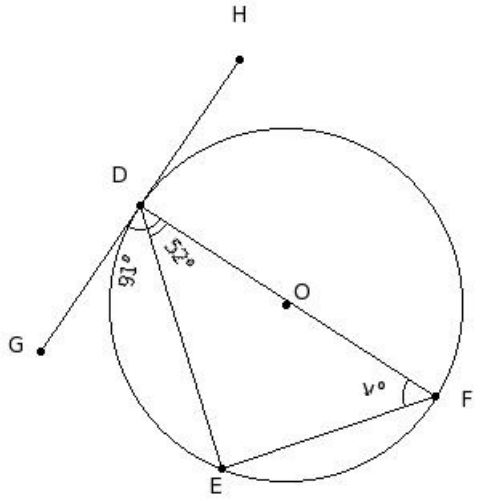
10. If two circles intersect, the number of their common tangents is

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

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

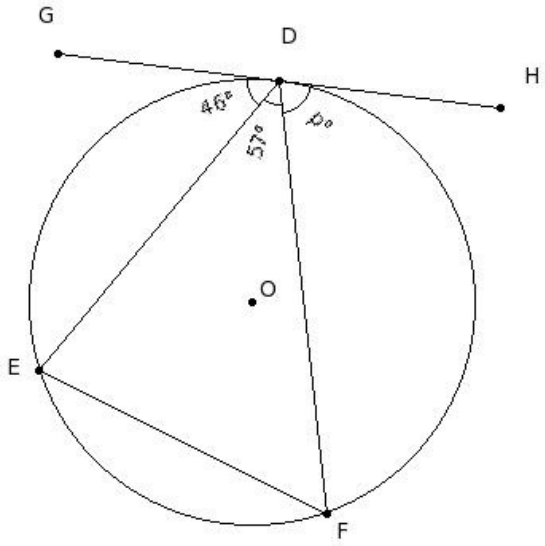
    (i) 2 (ii) 1 (iii) 4 (iv) 3 (v) 6

12. In the given figure, O is the centre of the circle and GH is the tangent at D. If ∠EDF = 52° and ∠GDE = 91°, find ∠DFE



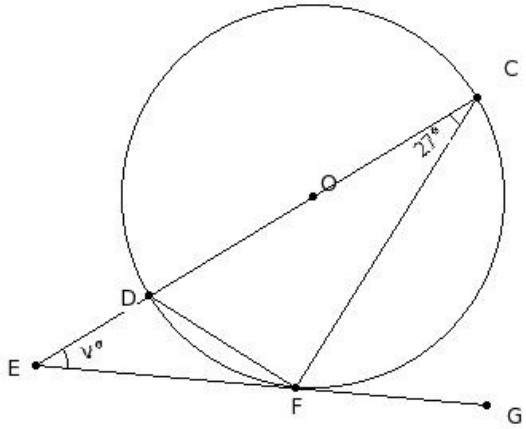
(i) 69° (ii) 39° (iii) 54° (iv) 44° (v) 49°

13. In the given figure, O is the centre of the circle and GH is the tangent at D. If ∠EDF = 57° and ∠GDE = 46°, find ∠FDH



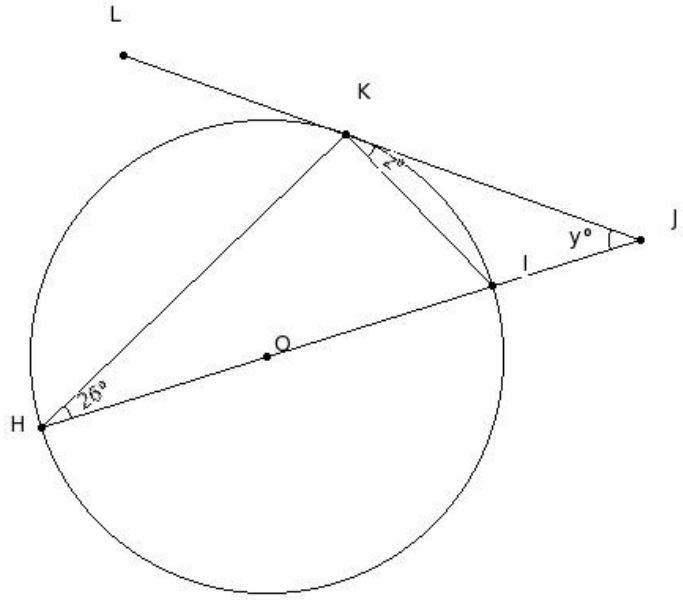
(i) 107° (ii) 87° (iii) 77° (iv) 92° (v) 82°

14. In the given figure, O is the centre of the circle and EG is the tangent at F . If ∠DCF = 27°, find ∠DEF



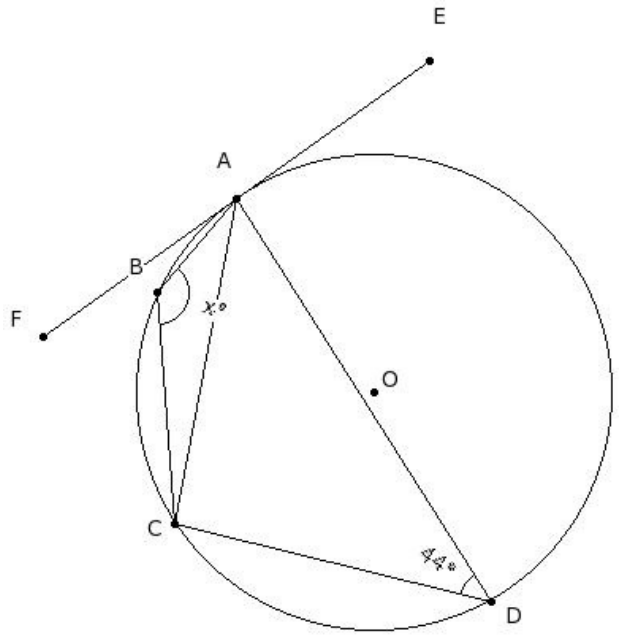
(i) 46° (ii) 51° (iii) 41° (iv) 36° (v) 66°

15. In the given figure, O is the centre of the circle and JL is the tangent at K. If ∠IHK = 26°, find ∠IJK + ∠IKJ



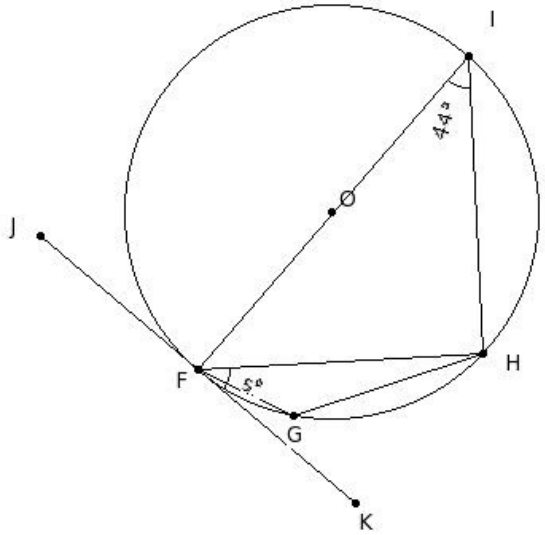
(i) 79° (ii) 64° (iii) 94° (iv) 74° (v) 69°

16. In the given figure, O is the centre of the circle and EF is the tangent at A. If ∠ADC = 44°, find ∠ABC



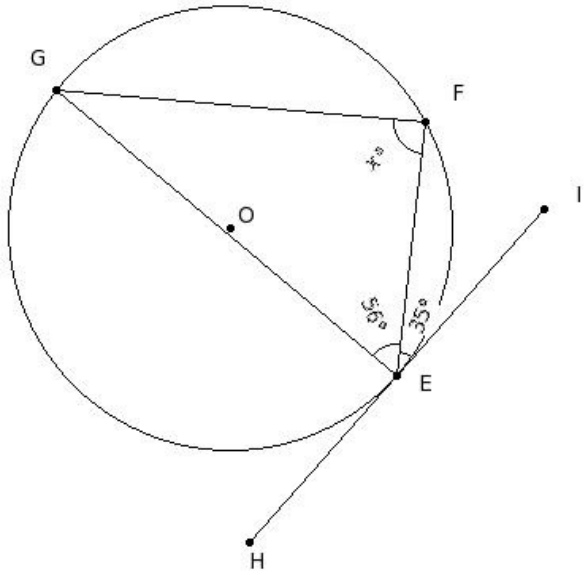
(i) 136° (ii) 141° (iii) 146° (iv) 151° (v) 166°

17. In the given figure, O is the centre of the circle and JK is the tangent at F. If ∠FIH = 44°, find ∠KFH



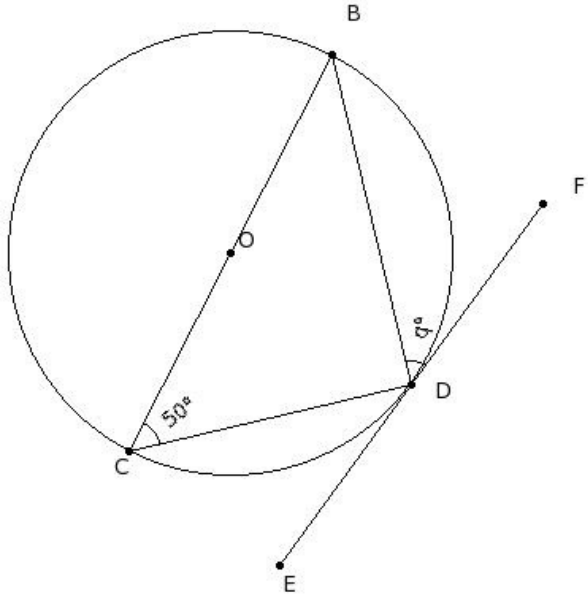
(i) 74° (ii) 54° (iii) 44° (iv) 59° (v) 49°

18. In the given figure, O is the centre of the circle and HI is the tangent at E. If ∠GEF = 56° and ∠FEI = 35°, find ∠GFE



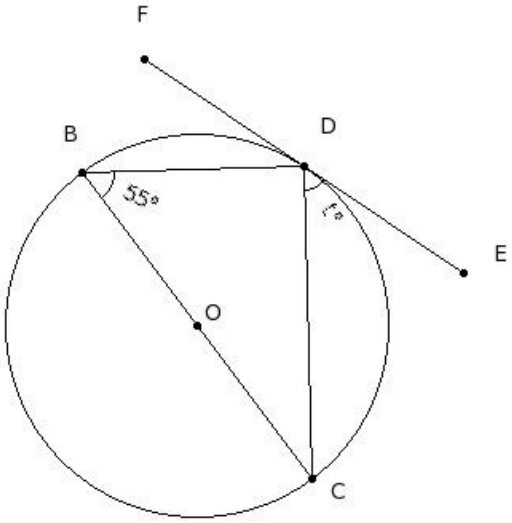
(i) 89° (ii) 94° (iii) 99° (iv) 119° (v) 104°

19. In the given figure, O is the centre of the circle and EF is the tangent at D. If ∠DCB = 50°, find ∠FDB



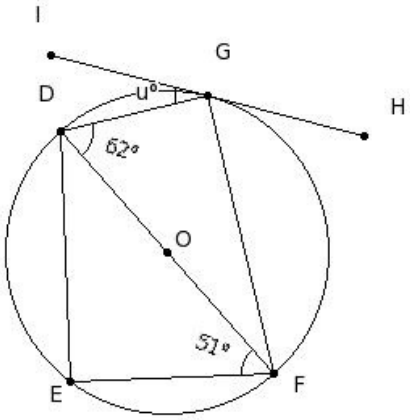
(i) 65° (ii) 60° (iii) 55° (iv) 80° (v) 50°

20. In the given figure, O is the centre of the circle and EF is the tangent at D. If ∠DBC = 55°, find ∠EDC



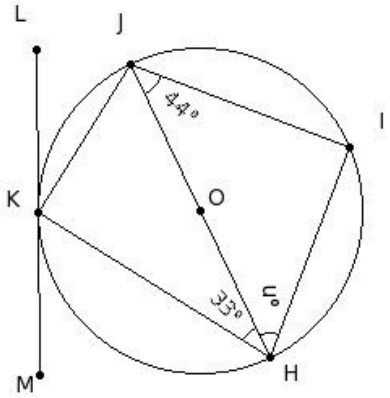
(i) 55° (ii) 65° (iii) 70° (iv) 85° (v) 60°

21. In the given figure, O is the centre of the circle and HI is the tangent at G. If ∠FDG = 62° and ∠DFE = 51°, find ∠IGD



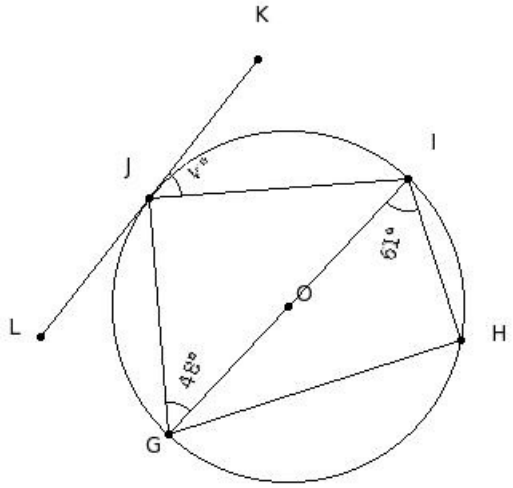
(i) 58° (ii) 33° (iii) 43° (iv) 28° (v) 38°

22. In the given figure, O is the centre of the circle and LM is the tangent at K. If ∠JHK = 33° and ∠HJI = 44°, find ∠JHI



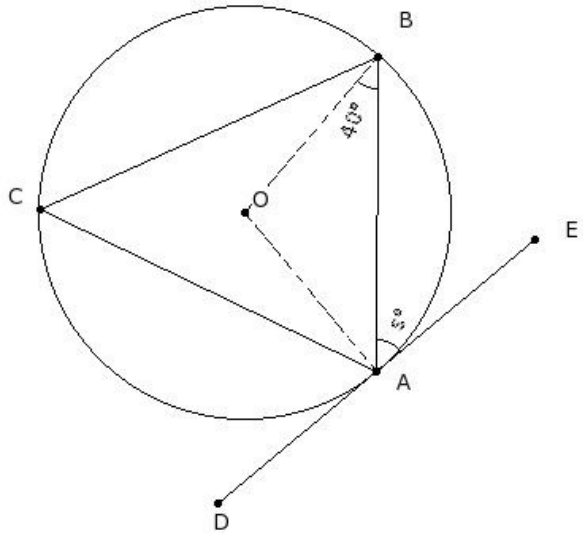
(i) 56° (ii) 51° (iii) 61° (iv) 46° (v) 76°

23. In the given figure, O is the centre of the circle and KL is the tangent at J. If ∠IGJ = 48° and ∠GIH = 61°, find ∠KJI



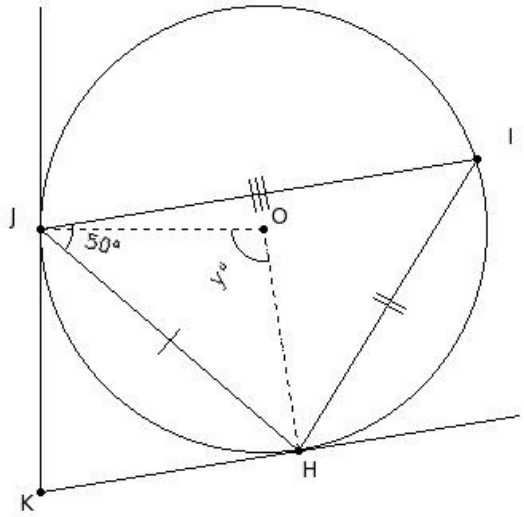
(i) 78° (ii) 58° (iii) 53° (iv) 48° (v) 63°

24. In the given figure, O is the centre of the circle and DE is the tangent at A. If ∠OBA = 40°, find ∠EAB



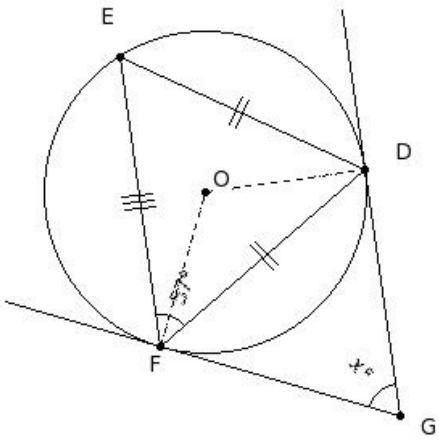
(i) 55° (ii) 60° (iii) 65° (iv) 50° (v) 80°

25. In the given figure, O is the centre of the circle and the tangents HK and JK meet at point K. If ∠IJH = 50°, find ∠HOJ



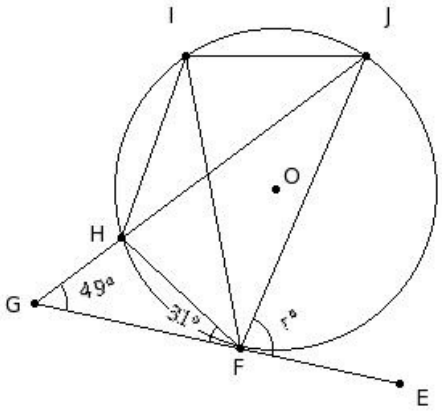
(i) 115° (ii) 105° (iii) 100° (iv) 130° (v) 110°

26. In the given figure, O is the centre of the circle and the tangents DG and FG meet at point G. If ∠EFD = 57°, find ∠FGD



(i) 66° (ii) 76° (iii) 81° (iv) 96° (v) 71°

27. In the given figure, O is the centre of the circle and EG is the tangent at F. If ∠FGH = 49°,∠GFH = 31°, find ∠JFE



(i) 95° (ii) 80° (iii) 110° (iv) 90° (v) 85°

28. Which of the following statements are true?

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

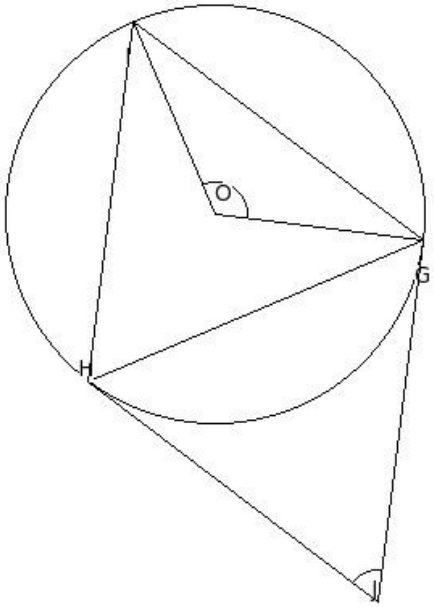
(i) {b,a,c} (ii) {b,d,e} (iii) {a,c,e} (iv) {b,a} (v) {d,c}

29. Which of the following statements are true?

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

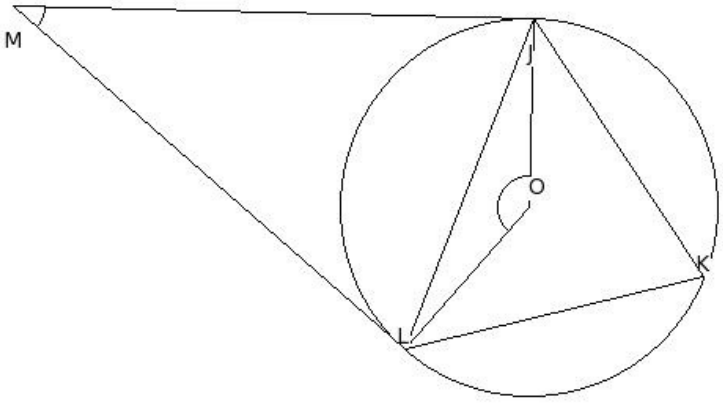
(i) {d,e} (ii) {b,e} (iii) {a,d} (iv) {b,e,d} (v) {c,a,d}

30. O is the centre of the circumcircle of △GHI. Tangents at G and H intersect at J. If ∠GJH = 59.82° and ∠GOI = 120°, find ∠IGH



(i) 74.91° (ii) 64.91° (iii) 69.91° (iv) 59.91° (v) 89.91°

31. O is the centre of the circumcircle of △JKL. Tangents at J and L intersect at M. If ∠JML = 39.82°, find ∠LKJ



(i) 80.09° (ii) 75.09° (iii) 85.09° (iv) 70.09° (v) 100.09°

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

(i) major segment (ii) chord (iii) secant (iv) diameter (v) tangent

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

(i) segment (ii) semi-circle (iii) radius (iv) centre (v) tangent

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) circumference (ii) diameter (iii) centre (iv) major segment (v) quadrant

35. Which of the following statements are true?

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

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

36. Which of the following statements are true?

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

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

37. Which of the following statements are true?

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

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

38. Which of the following statements are true?

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

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

39. Which of the following statements are true?

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

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

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

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

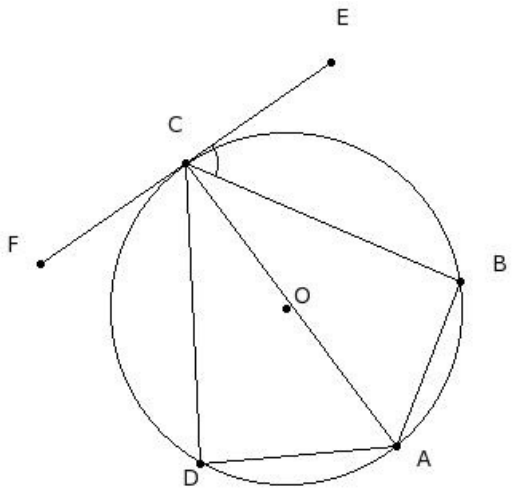
41. Two circles are of radii 6 cm and 1 cm. If the distance between their centres is 10 cm, what is the length of their direct common tangent?

(i) 10.66 cm (ii) 8.66 cm (iii) 9.66 cm (iv) 7.66 cm (v) 6.66 cm

42. Two circles are of radii 5 cm and 6 cm. If the distance between their centres is 14 cm, what is the length of their transverse common tangent?

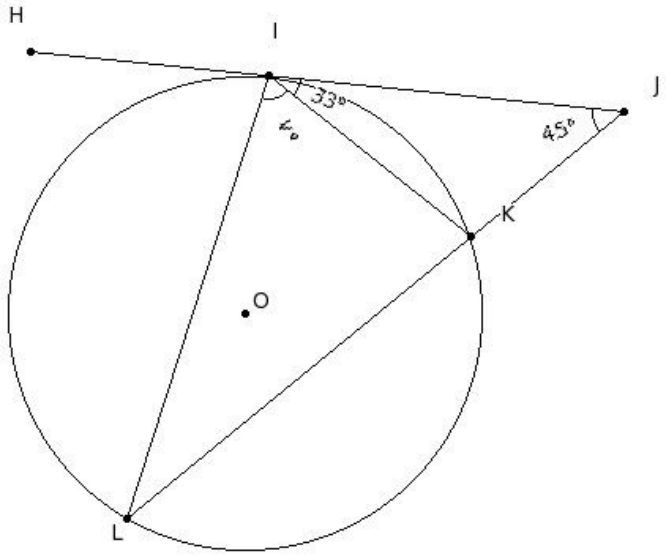
(i) 8.66 cm (ii) 6.66 cm (iii) 9.66 cm (iv) 7.66 cm (v) 10.66 cm

43. In the given figure, ABCD is a cyclic quadrilateral such that CA bisects ∠DAB and EF is the tangent at C. If ∠CAB = 58°, find ∠ECB



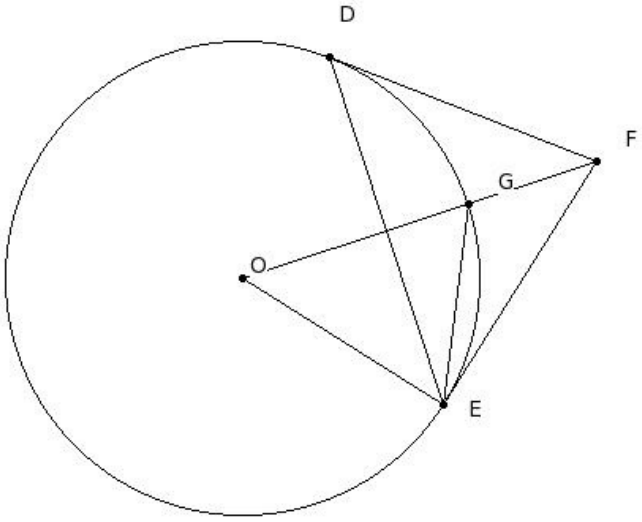
(i) 58° (ii) 73° (iii) 88° (iv) 68° (v) 63°

44. In the given figure, O is the centre of the circle and HJ is the tangent at I. If ∠IJK = 45°,∠JIK = 33°, find ∠LIK



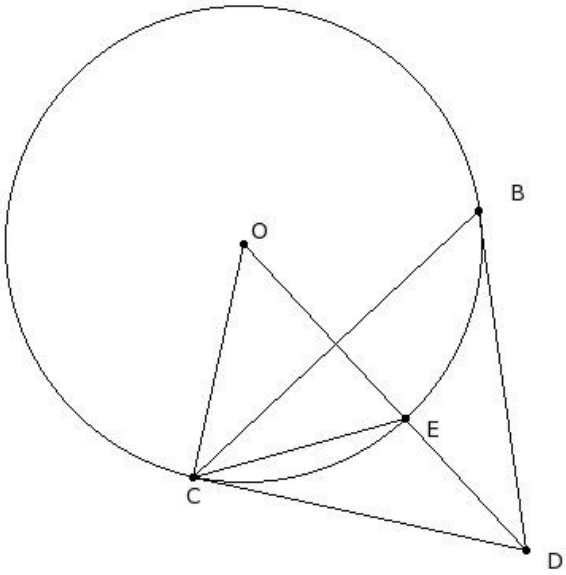
(i) 99° (ii) 69° (iii) 84° (iv) 79° (v) 74°

45. In the given figure, FD and FE are tangent segments to the circle with centre O. Given ∠EFG = 40°, find ∠DEO



(i) 70° (ii) 50° (iii) 40° (iv) 55° (v) 45°

46. In the given figure, DB and DC are tangent segments to the circle with centre O. Given ∠CDE = 35°, find ∠BCE



(i) 42.5° (ii) 27.5° (iii) 32.5° (iv) 57.5° (v) 37.5°

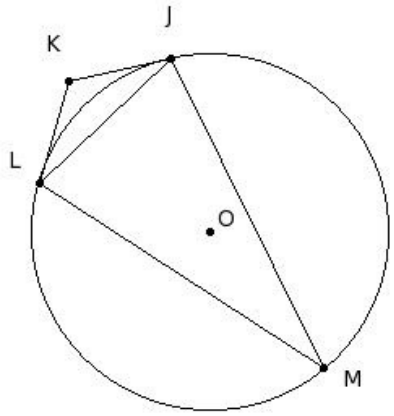
47. With the vertices of a triangle △BCD as centres, three circles are drawn touching each other externally. If the sides of the triangle are 12 cm , 15 cm and 13 cm , find the radii of the circles

(i) 5 cm , 7 cm & 8 cm respectively (ii) 10 cm , 7 cm & 8 cm respectively

(iii) 5 cm , 12 cm & 8 cm respectively (iv) 5 cm , 7 cm & 13 cm respectively

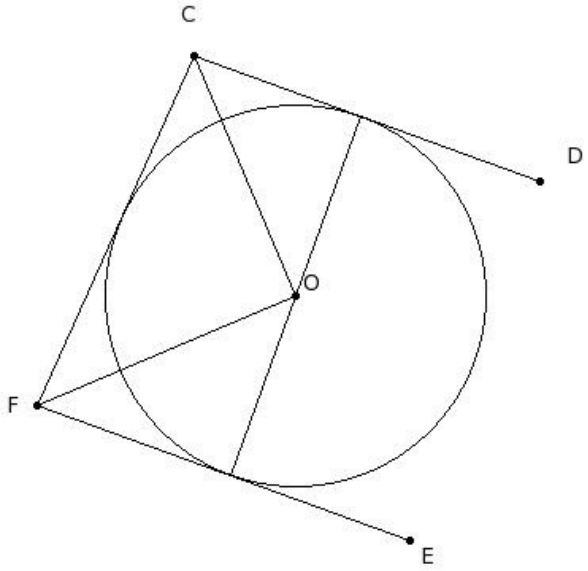
(v) 10 cm , 12 cm & 13 cm respectively

48. O is the centre of the circle. JK and LK are tangents to the circle. If ∠LMJ = 30.5°, find ∠JKL



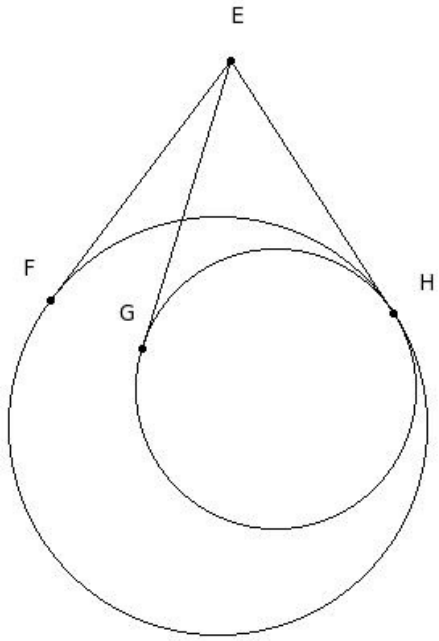
(i) 149° (ii) 129° (iii) 124° (iv) 134° (v) 119°

49. In the given figure, CD and EF are parallel tangents to the circle with centre O. CF is another tangent meeting CD and EF at C and F. Find ∠COF



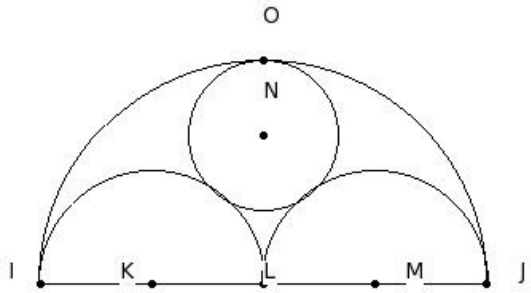
(i) 95° (ii) 105° (iii) 100° (iv) 120° (v) 90°

50. In the given figure, EH is the common tangent to the two circles. EF & EG are also tangents. Given EF = 19 cm, find EG



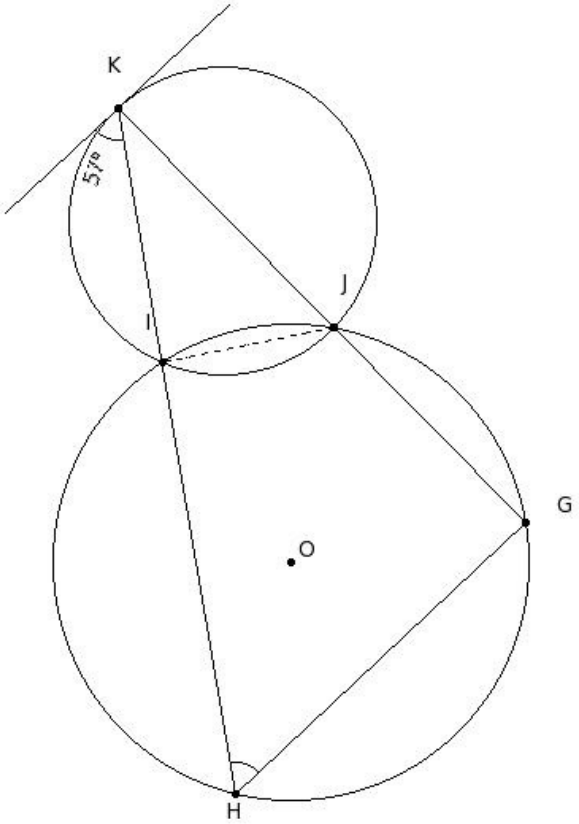
(i) 21 cm (ii) 19 cm (iii) 17 cm (iv) 18 cm (v) 20 cm

51. IJ is a line segment and L is its mid-point. Three semi-circles are drawn with IL , LJ and IJ as diameters. K , M and L respectively are the centres of these semi-circles. A new circle is drawn touching these three semi-circles. Find its radius, given IK = 7 cm



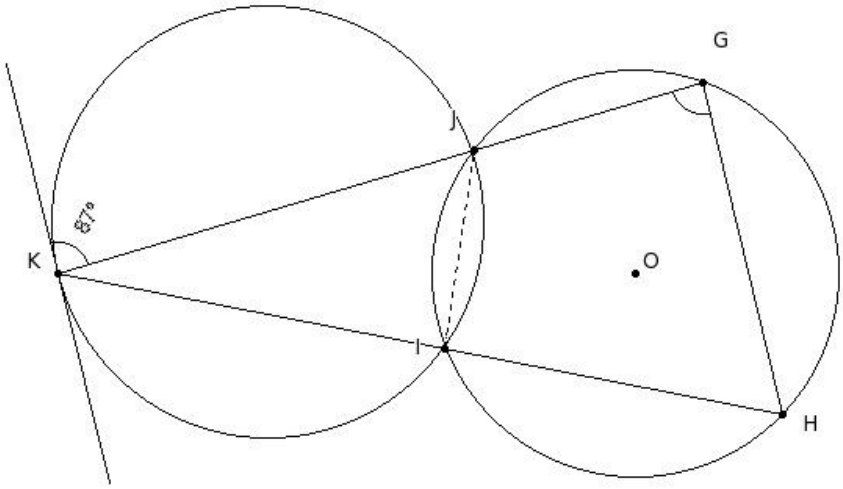
(i) 2.67 cm (ii) 3.67 cm (iii) 4.67 cm (iv) 6.67 cm (v) 5.67 cm

52. In the given figure, two circles intersect at points I & J. A tangent is drawn at point K. From the same point, two lines are drawn passing through points I & J. They meet the other end of the second circle at H & G. Given ∠K = 57°, find ∠GHI



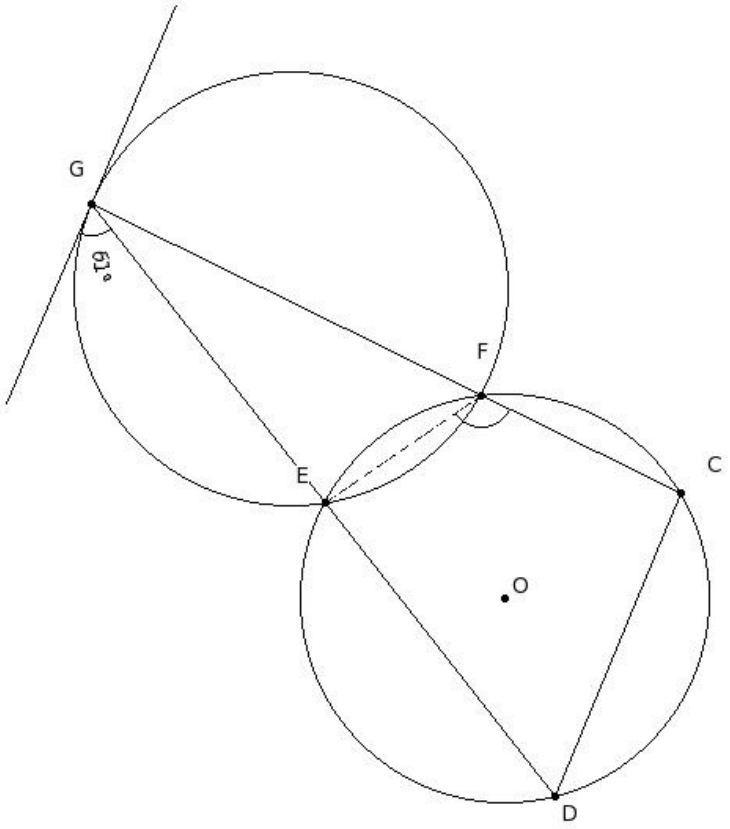
(i) 62° (ii) 87° (iii) 57° (iv) 72° (v) 67°

53. In the given figure, two circles intersect at points I & J. A tangent is drawn at point K. From the same point, two lines are drawn passing through points I & J. They meet the other end of the second circle at H & G. Given ∠K = 87°, find ∠HGJ



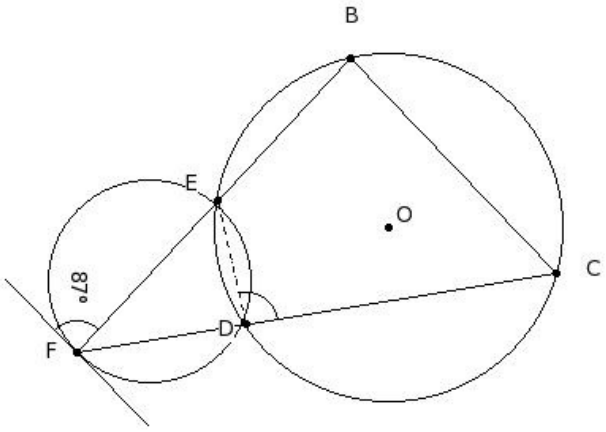
(i) 97° (ii) 92° (iii) 87° (iv) 102° (v) 117°

54. 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 = 61°, find ∠CFE



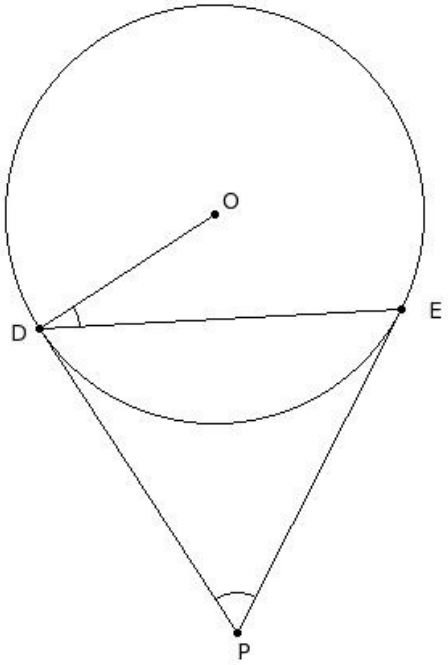
(i) 129° (ii) 149° (iii) 124° (iv) 134° (v) 119°

55. In the given figure, two circles intersect at points D & E. A tangent is drawn at point F. From the same point, two lines are drawn passing through points D & E. They meet the other end of the second circle at C & B. Given ∠F = 87°, find ∠CDE



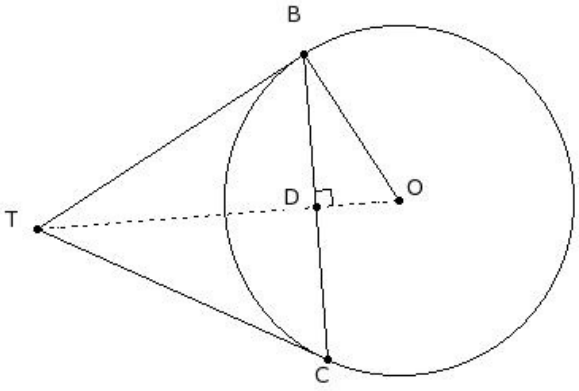
(i) 108° (ii) 98° (iii) 93° (iv) 123° (v) 103°

56. In the given figure, DP & EP are tangents to the circle with centre O. Given ∠P = 60°, find ∠D



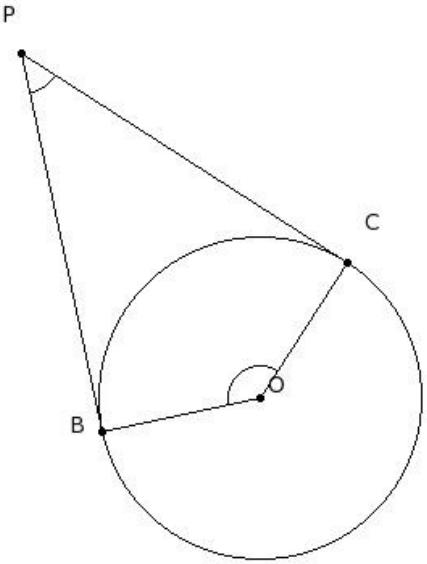
(i) 45° (ii) 40° (iii) 60° (iv) 35° (v) 30°

57. In the given figure, BT & CT are tangents to the circle with centre O. Given OB = 11 cm and BC = 19 cm, find BT



(i) 19.84 cm (ii) 16.84 cm (iii) 18.84 cm (iv) 17.84 cm (v) 20.84 cm

58. In the given figure, BP & CP are tangents to the circle with centre O. Given ∠BOC = 135°, find ∠BPC



(i) 50° (ii) 55° (iii) 60° (iv) 45° (v) 75°

Assignment Key

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