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

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

7. If two circles of radii 10 cm and 3 cm touch internally, the distance between their centres is

   (i) 5 cm (ii) 7 cm (iii) 6 cm (iv) 9 cm (v) 8 cm

8. If two circles of radii 13 cm and 5 cm touch externally, the distance between their centres is

   (i) 18 cm (ii) 19 cm (iii) 16 cm (iv) 20 cm (v) 17 cm

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

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

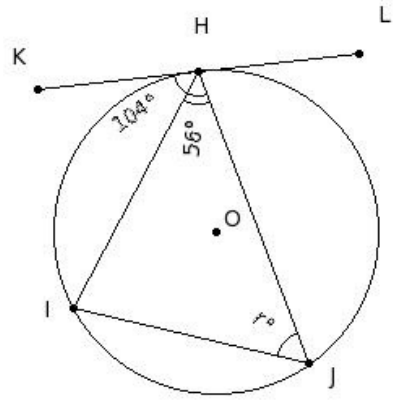
10. If two circles intersect, the number of their common tangents is

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

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

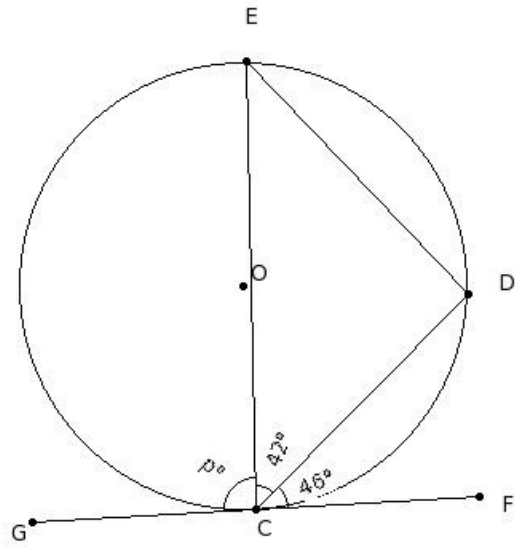
    (i) 0 (ii) 3 (iii) 2 (iv) 4 (v) 5

12. In the given figure, O is the centre of the circle and KL is the tangent at H. If ∠IHJ = 56° and ∠KHI = 104°, find ∠HJI



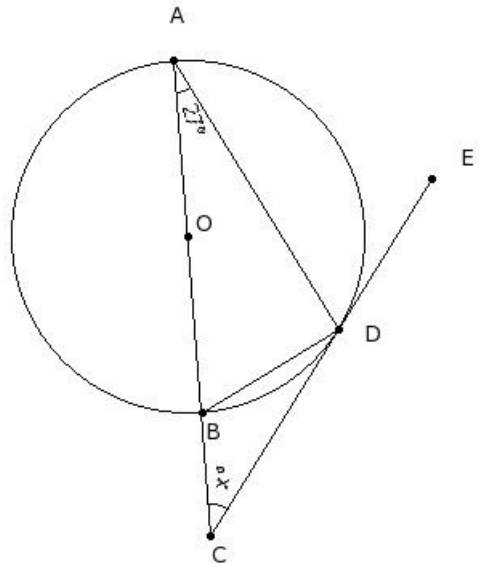
(i) 58° (ii) 63° (iii) 78° (iv) 53° (v) 48°

13. In the given figure, O is the centre of the circle and FG is the tangent at C. If ∠DCE = 42° and ∠FCD = 46°, find ∠ECG



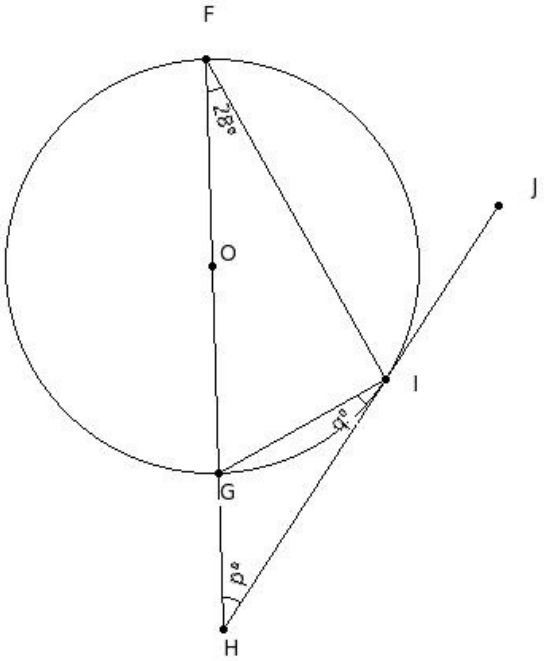
(i) 107° (ii) 102° (iii) 92° (iv) 97° (v) 122°

14. In the given figure, O is the centre of the circle and CE is the tangent at D . If ∠BAD = 27°, find ∠BCD



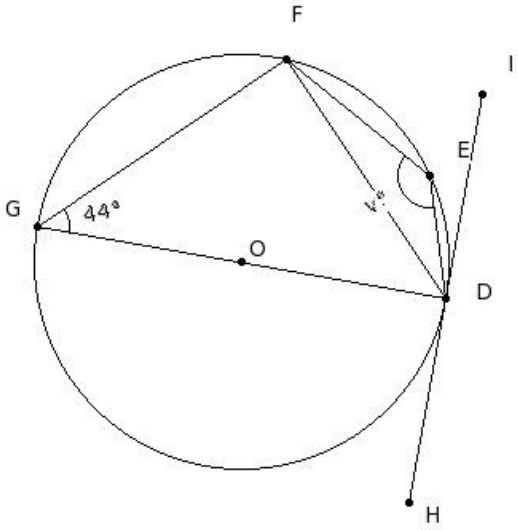
(i) 41° (ii) 46° (iii) 36° (iv) 51° (v) 66°

15. In the given figure, O is the centre of the circle and HJ is the tangent at I. If ∠GFI = 28°, find ∠GHI + ∠GIH



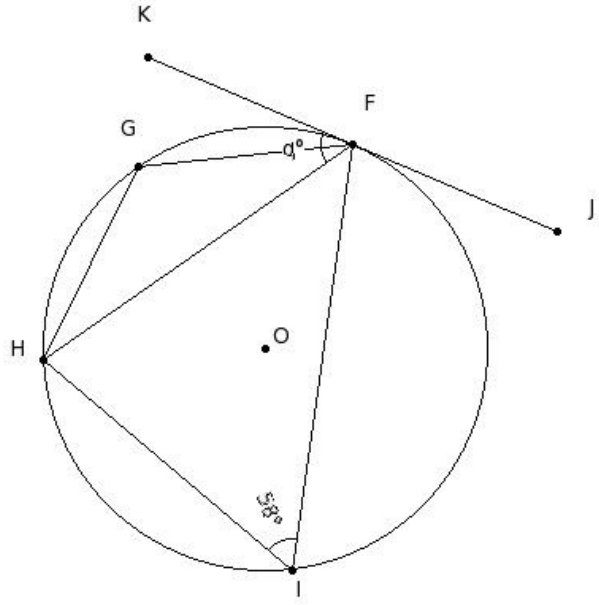
(i) 92° (ii) 72° (iii) 77° (iv) 62° (v) 67°

16. In the given figure, O is the centre of the circle and HI is the tangent at D. If ∠DGF = 44°, find ∠DEF



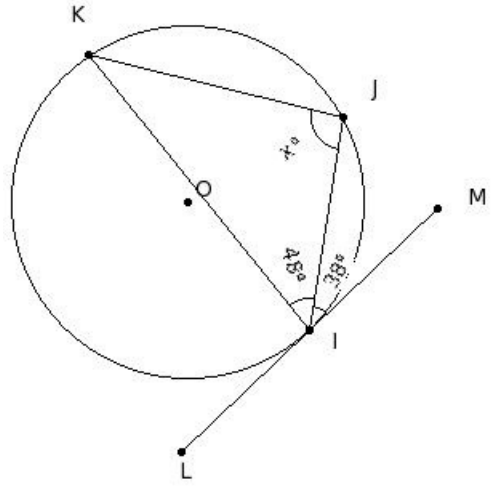
(i) 151° (ii) 141° (iii) 166° (iv) 146° (v) 136°

17. In the given figure, O is the centre of the circle and JK is the tangent at F. If ∠FIH = 58°, find ∠KFH



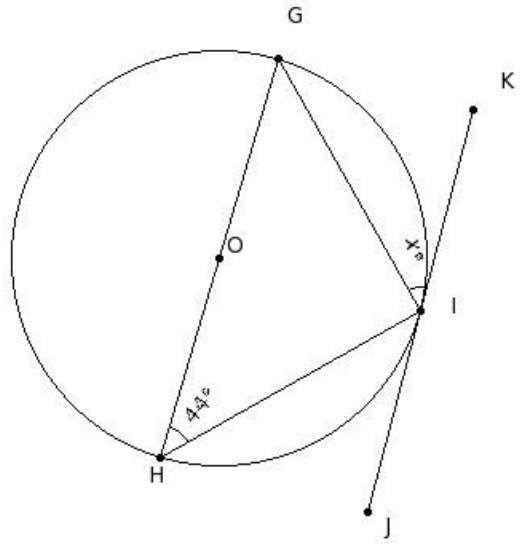
(i) 58° (ii) 63° (iii) 88° (iv) 68° (v) 73°

18. In the given figure, O is the centre of the circle and LM is the tangent at I. If ∠KIJ = 48° and ∠JIM = 38°, find ∠KJI



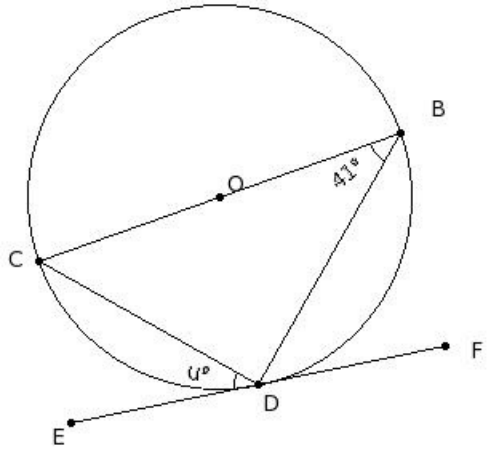
(i) 99° (ii) 94° (iii) 109° (iv) 124° (v) 104°

19. In the given figure, O is the centre of the circle and JK is the tangent at I. If ∠IHG = 44°, find ∠KIG



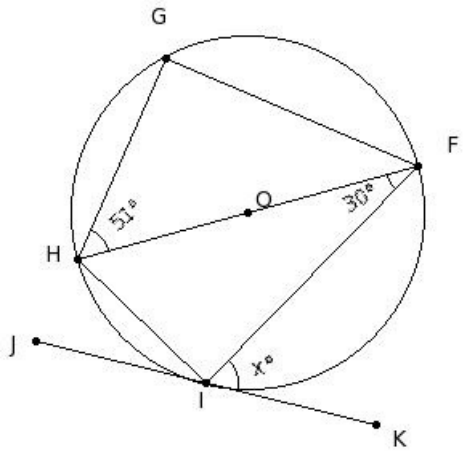
(i) 59° (ii) 74° (iii) 49° (iv) 44° (v) 54°

20. In the given figure, O is the centre of the circle and EF is the tangent at D. If ∠DBC = 41°, find ∠EDC



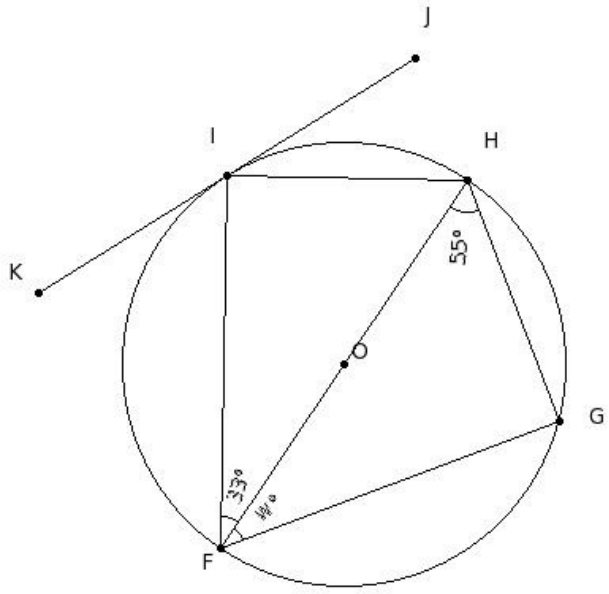
(i) 71° (ii) 46° (iii) 56° (iv) 41° (v) 51°

21. In the given figure, O is the centre of the circle and JK is the tangent at I. If ∠HFI = 30° and ∠FHG = 51°, find ∠KIF



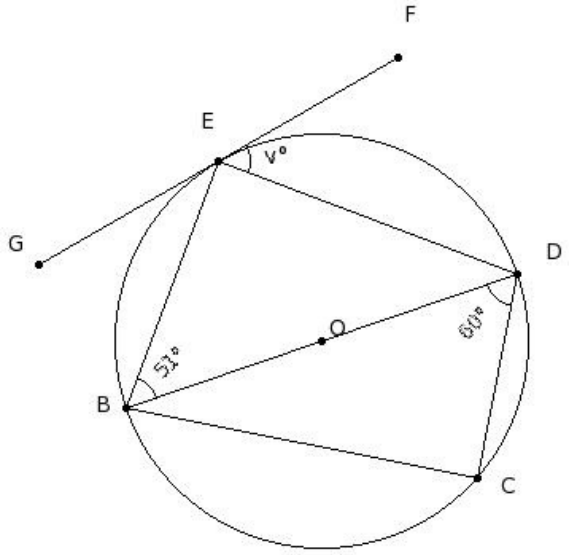
(i) 70° (ii) 65° (iii) 60° (iv) 75° (v) 90°

22. In the given figure, O is the centre of the circle and JK is the tangent at I. If ∠HFI = 33° and ∠FHG = 55°, find ∠HFG



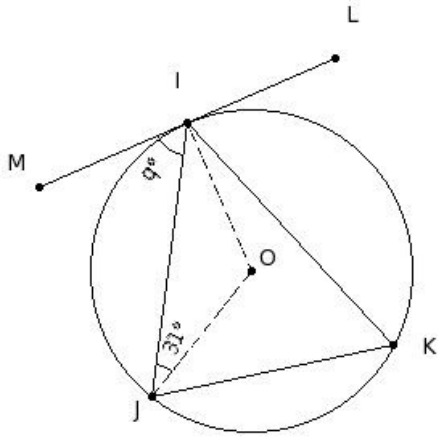
(i) 35° (ii) 40° (iii) 65° (iv) 50° (v) 45°

23. In the given figure, O is the centre of the circle and FG is the tangent at E. If ∠DBE = 51° and ∠BDC = 60°, find ∠FED



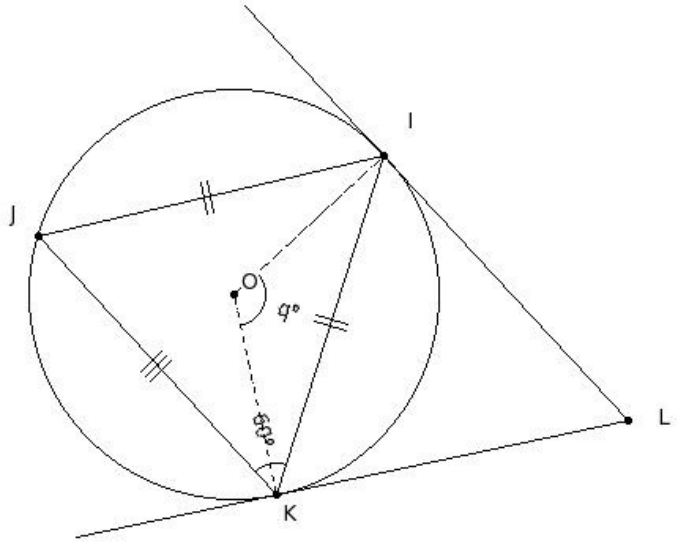
(i) 81° (ii) 66° (iii) 51° (iv) 56° (v) 61°

24. In the given figure, O is the centre of the circle and LM is the tangent at I. If ∠OJI = 31°, find ∠MIJ



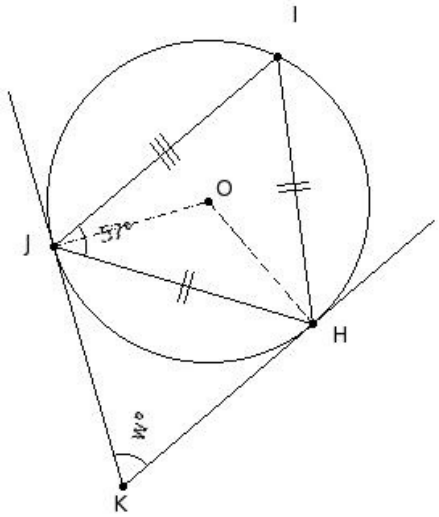
(i) 74° (ii) 69° (iii) 89° (iv) 59° (v) 64°

25. In the given figure, O is the centre of the circle and the tangents IL and KL meet at point L. If ∠JKI = 60°, find ∠IOK



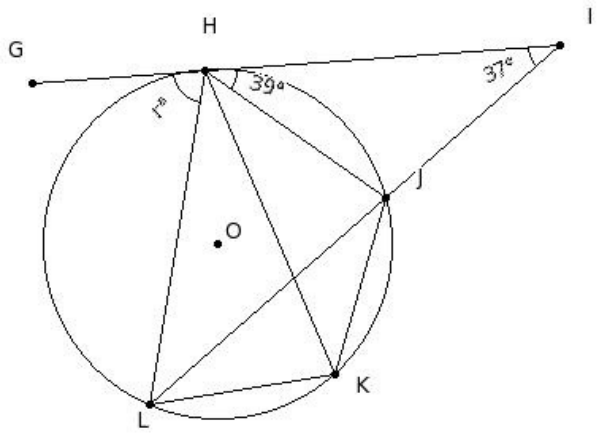
(i) 120° (ii) 125° (iii) 130° (iv) 135° (v) 150°

26. In the given figure, O is the centre of the circle and the tangents HK and JK meet at point K. If ∠IJH = 57°, find ∠JKH



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

27. In the given figure, O is the centre of the circle and GI is the tangent at H. If ∠HIJ = 37°,∠IHJ = 39°, find ∠LHG



(i) 91° (ii) 106° (iii) 86° (iv) 81° (v) 76°

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.

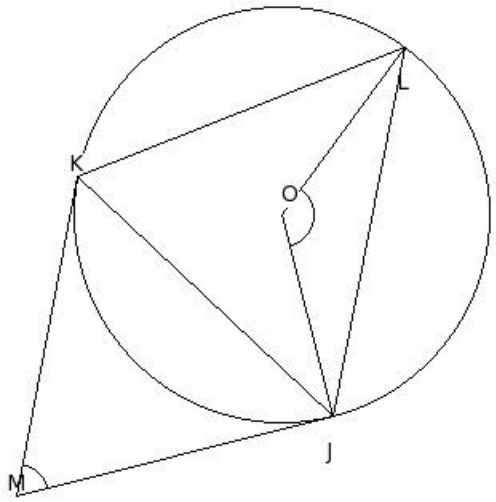
(i) {a,b,e} (ii) {a,c} (iii) {c,d,e} (iv) {a,c,d} (v) {b,d}

29. Which of the following statements are true?

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

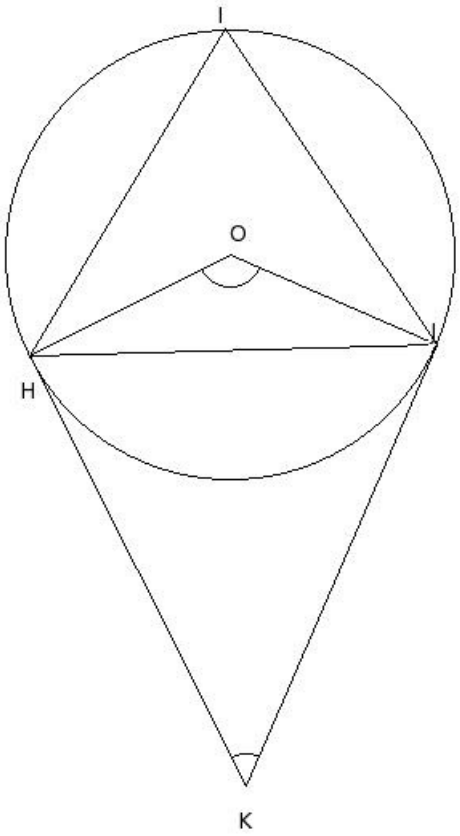
(i) {d,b,a} (ii) {c,a} (iii) {d,b} (iv) {e,c,a} (v) {a,b}

30. O is the centre of the circumcircle of △JKL. Tangents at J and K intersect at M. If ∠JMK = 65.07° and ∠JOL = 130°, find ∠LJK



(i) 72.53° (ii) 57.53° (iii) 87.53° (iv) 67.53° (v) 62.53°

31. O is the centre of the circumcircle of △HIJ. Tangents at H and J intersect at K. If ∠HKJ = 50.14°, find ∠JIH



(i) 69.93° (ii) 94.93° (iii) 64.93° (iv) 79.93° (v) 74.93°

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

(i) chord (ii) semi-circle (iii) radius (iv) quadrant (v) secant

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

(i) tangent (ii) diameter (iii) centre (iv) semi-circle (v) circumference

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) tangent (ii) semi-circle (iii) secant (iv) diameter (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) Atmost three common tangents can be drawn touching two circles which touch each other.
d) A maximum of four common tangents can be drawn touching any two circles.

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

36. Which of the following statements are true?

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

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

37. Which of the following statements are true?

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

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

38. Which of the following statements are true?

a) A line parallel to a tangent is a secant.
b) If two tangents are perpendicular, they form a right angled triangle with their points of contact with the circle and their point of intersection.
c) Two different tangents can meet at a point on the circle.
d) If two tangents are parallel, the distance between them is equal to the diameter of the circle.
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) {a,c,e} (ii) {b,d,e} (iii) {a,b} (iv) {c,d} (v) {a,b,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 intersect, then two common tangents can be drawn.
c) If two circles touch each other externally, there is only one common tangent.
d) If two circles touch each other internally, there is only one common tangent.

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

40. Which of the following statements are true?

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

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

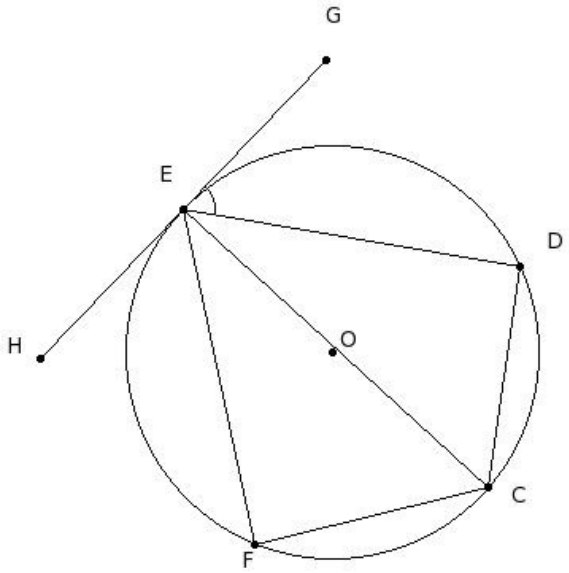
41. Two circles are of radii 4 cm and 4 cm. If the distance between their centres is 10 cm, what is the length of their direct common tangent?

(i) 8.00 cm (ii) 9.00 cm (iii) 12.00 cm (iv) 10.00 cm (v) 11.00 cm

42. Two circles are of radii 3 cm and 3 cm. If the distance between their centres is 10 cm, what is the length of their transverse common tangent?

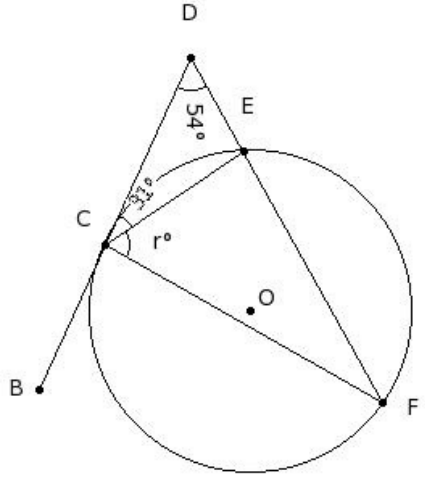
(i) 6.00 cm (ii) 10.00 cm (iii) 9.00 cm (iv) 7.00 cm (v) 8.00 cm

43. In the given figure, CDEF is a cyclic quadrilateral such that EC bisects ∠FCD and GH is the tangent at E. If ∠ECD = 56°, find ∠GED



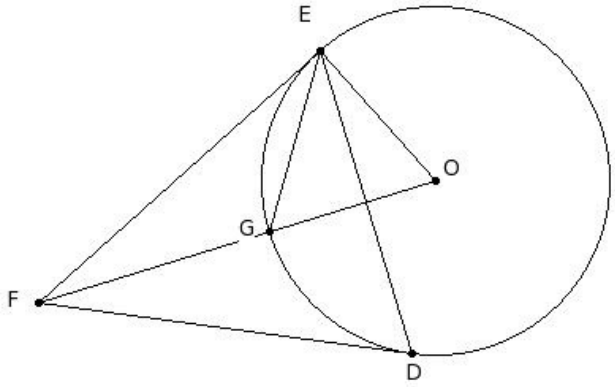
(i) 61° (ii) 56° (iii) 86° (iv) 71° (v) 66°

44. In the given figure, O is the centre of the circle and BD is the tangent at C. If ∠CDE = 54°,∠DCE = 31°, find ∠FCE



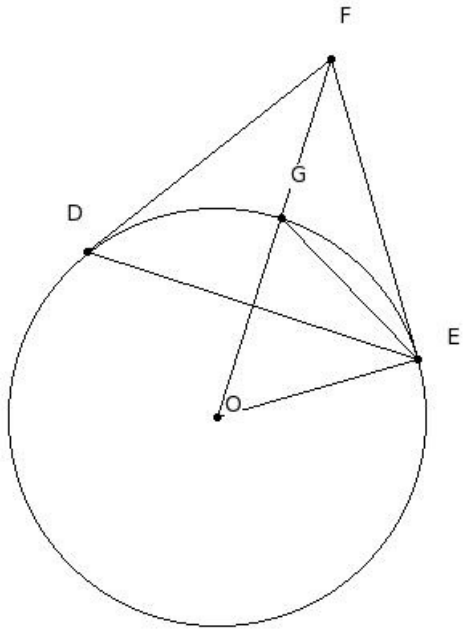
(i) 69° (ii) 74° (iii) 94° (iv) 79° (v) 64°

45. In the given figure, FD and FE are tangent segments to the circle with centre O. Given ∠EFG = 25°, find ∠DEO



(i) 30° (ii) 55° (iii) 25° (iv) 40° (v) 35°

46. In the given figure, FD and FE are tangent segments to the circle with centre O. Given ∠EFG = 34°, find ∠DEG



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

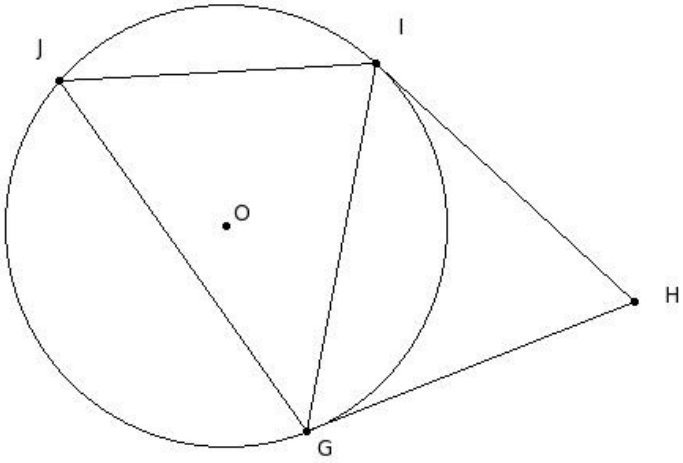
47. With the vertices of a triangle △GHI as centres, three circles are drawn touching each other externally. If the sides of the triangle are 10 cm , 16 cm and 10 cm , find the radii of the circles

(i) 7 cm , 8 cm & 8 cm respectively (ii) 7 cm , 13 cm & 13 cm respectively

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

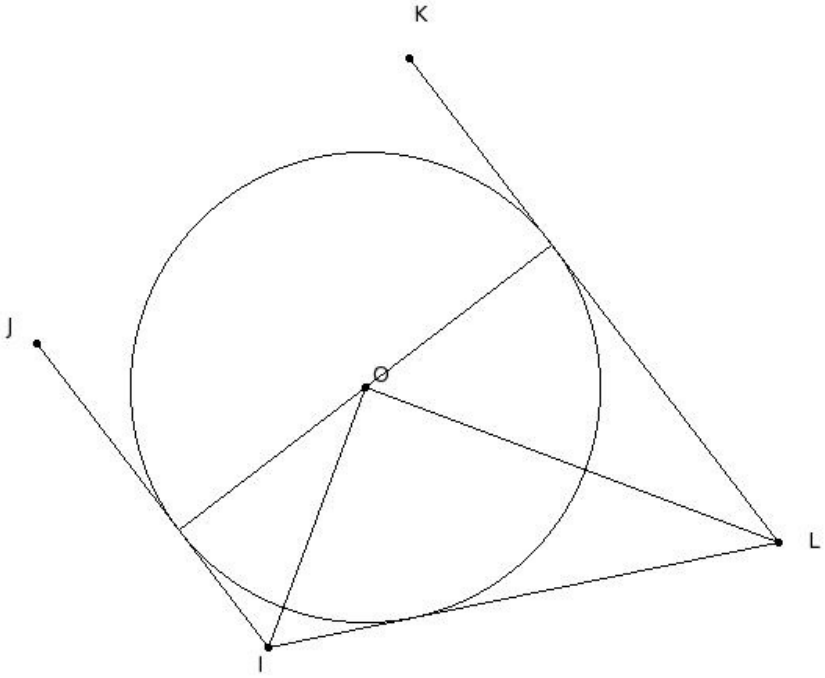
(v) 2 cm , 8 cm & 13 cm respectively

48. O is the centre of the circle. GH and IH are tangents to the circle. If ∠IJG = 58°, find ∠GHI



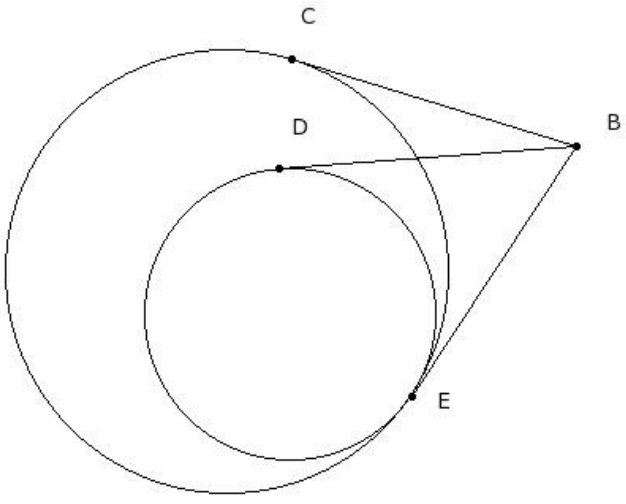
(i) 94° (ii) 79° (iii) 74° (iv) 64° (v) 69°

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



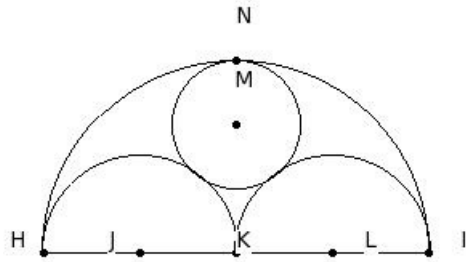
(i) 105° (ii) 120° (iii) 95° (iv) 90° (v) 100°

50. In the given figure, BE is the common tangent to the two circles. BC & BD are also tangents. Given BC = 19 cm, find BD



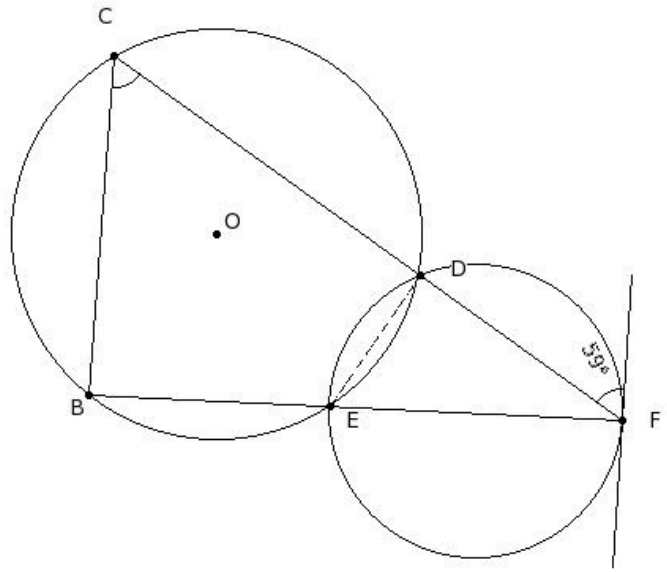
(i) 21 cm (ii) 19 cm (iii) 20 cm (iv) 17 cm (v) 18 cm

51. HI is a line segment and K is its mid-point. Three semi-circles are drawn with HK , KI and HI as diameters. J , L and K respectively are the centres of these semi-circles. A new circle is drawn touching these three semi-circles. Find its radius, given HJ = 6 cm



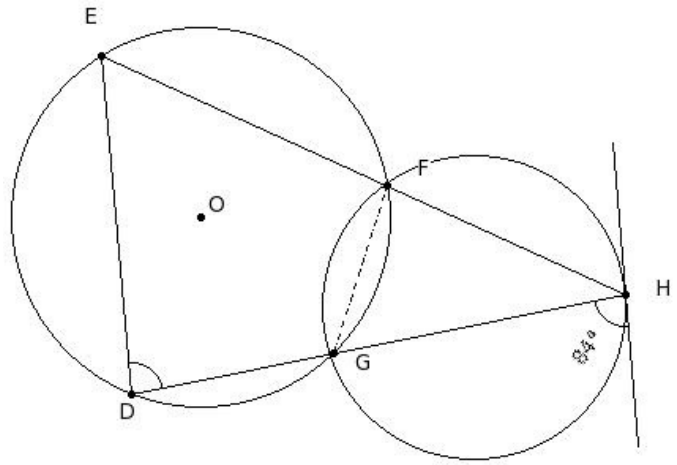
(i) 3.00 cm (ii) 2.00 cm (iii) 5.00 cm (iv) 4.00 cm (v) 6.00 cm

52. 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 = 59°, find ∠BCD



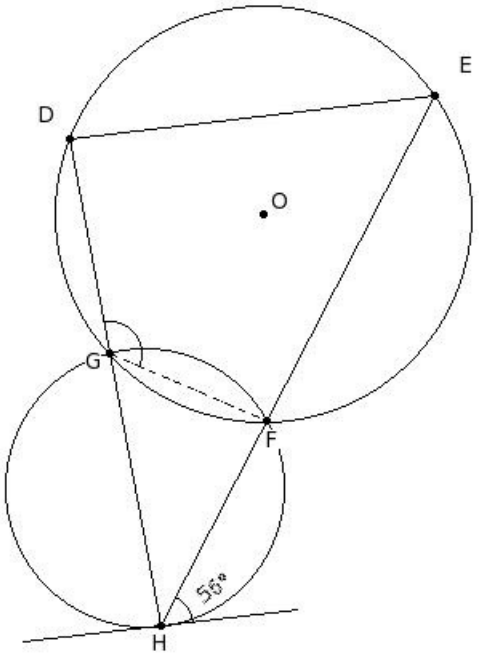
(i) 74° (ii) 69° (iii) 59° (iv) 64° (v) 89°

53. In the given figure, two circles intersect at points F & G. A tangent is drawn at point H. From the same point, two lines are drawn passing through points F & G. They meet the other end of the second circle at E & D. Given ∠H = 84°, find ∠EDG



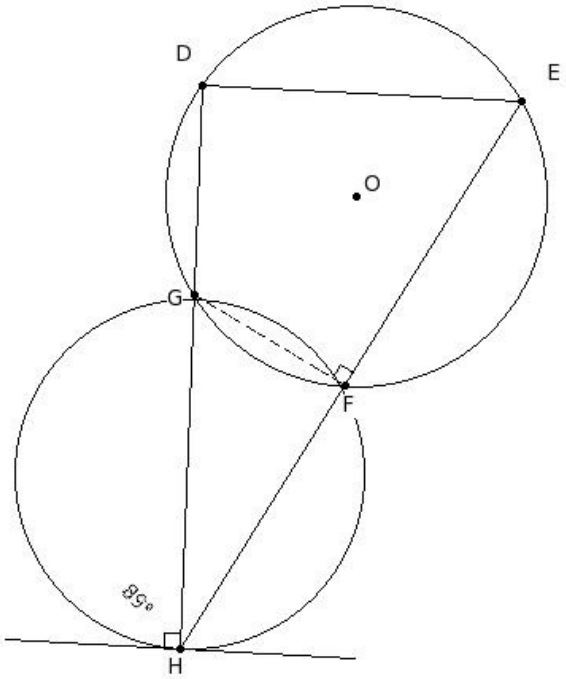
(i) 94° (ii) 89° (iii) 99° (iv) 84° (v) 114°

54. In the given figure, two circles intersect at points F & G. A tangent is drawn at point H. From the same point, two lines are drawn passing through points F & G. They meet the other end of the second circle at E & D. Given ∠H = 56°, find ∠DGF



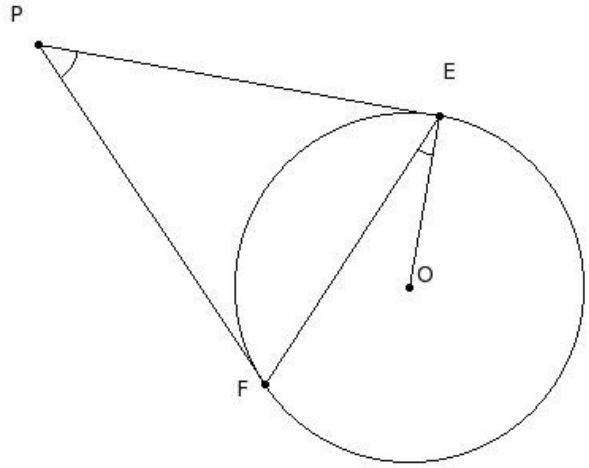
(i) 129° (ii) 139° (iii) 154° (iv) 134° (v) 124°

55. In the given figure, two circles intersect at points F & G. A tangent is drawn at point H. From the same point, two lines are drawn passing through points F & G. They meet the other end of the second circle at E & D. Given ∠H = 89°, find ∠EFG



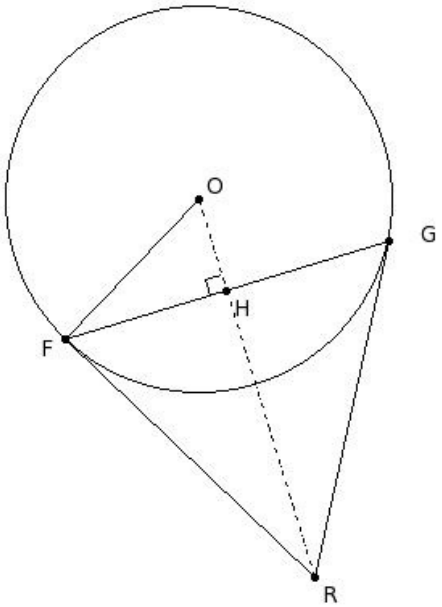
(i) 121° (ii) 101° (iii) 96° (iv) 91° (v) 106°

56. In the given figure, EP & FP are tangents to the circle with centre O. Given ∠P = 46°, find ∠E



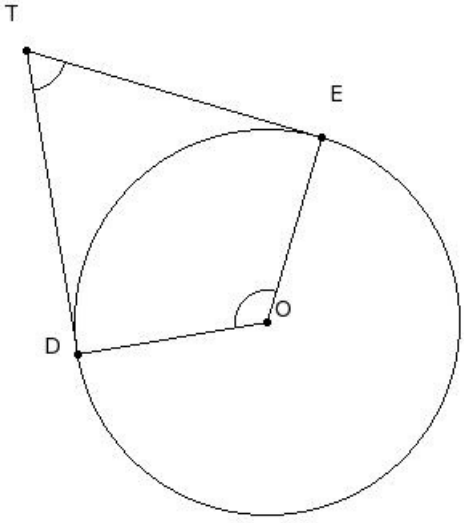
(i) 28° (ii) 33° (iii) 38° (iv) 23° (v) 53°

57. In the given figure, FR & GR are tangents to the circle with centre O. Given OF = 12 cm and FG = 21 cm, find FR



(i) 21.69 cm (ii) 20.69 cm (iii) 23.69 cm (iv) 22.69 cm (v) 19.69 cm

58. In the given figure, DT & ET are tangents to the circle with centre O. Given ∠DTE = 64°, find ∠DOE



(i) 146° (ii) 116° (iii) 131° (iv) 121° (v) 126°

Assignment Key

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