EXERCISE # 1
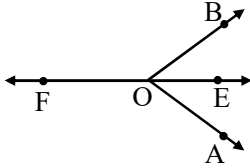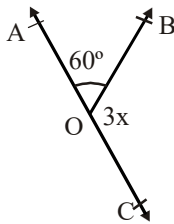
A. Very Short Answer Type Questions
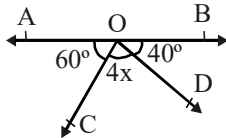
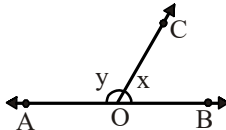**Q.1** In given figure, Ray OE bisects ∠AOB and OF is a ray opposite to OE. Show that ∠FOB = ∠FOA.

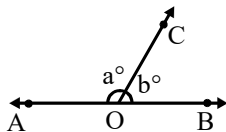**Q.2** In figure, AOC is a line, find x.

Q.3 In figure, AOB is a line, determine x.
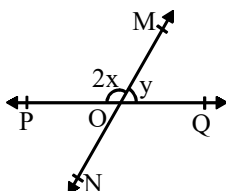
Q.4 In figure, OA and OB are the opposite rays:

(i) If y = 110°, what is the value of x ?
(ii) If x = 75°, what is the value of y ?

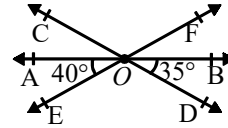**Q.5** In figure, ∠AOC and ∠BOC form a linear pair. If a – b = 80°, find the values of a and b.

Q.6 In figure, $\overleftrightarrow{PQ}$ and $\overleftrightarrow{MN}$ intersect at O.
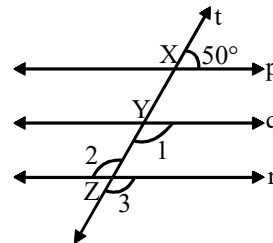
(i) Determine y when x = 60°
(ii) Determine x when y = 40°

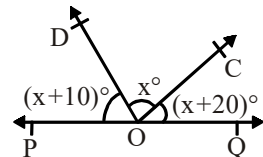**Q.7** In figure, lines AB, CD and EF intersect at O. Find the measures of ∠AOC, ∠COF.

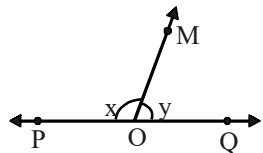**Q.8** In figure, p, q and r are parallel lines intersected by transversal t at X, Y and Z respectively. Find ∠1, ∠2 and ∠3.

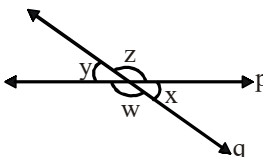**Q.9** In figure, OP and OQ are opposite rays. Find x.

Q.10 In figure, ∠POM and ∠QOM form a linear pair. If x – 2y = 30°, find x and y.

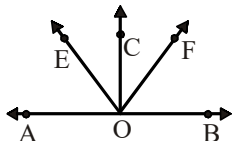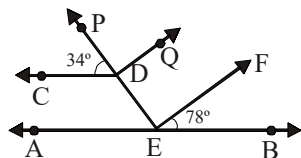**Q.11** In figure, lines p and q intersect at O. If x = 35°, find the values of y, z, w.

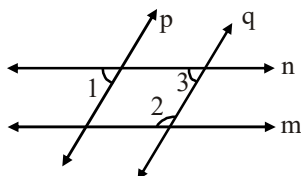**Q.12** In figure, OE bisects ∠AOC, OF bisects ∠COB and OE ⊥ OF. Show that A, O, B are collinear.

Q.13 In figure, AB ∥ CD and EF ∥ DQ. Determine ∠PDQ, ∠AED and ∠DEF.

Q.14 In figure, m ∥ n and p ∥ q. If ∠1 = 75º, prove that $\angle 2 = \angle 1 + \dfrac{1}{3}$ of a right angle.

Q.15 Prove that two angles which have their arms parallel are either equal or supplementary.

Q.16 In figure, AB ∥ DC. If $x = \dfrac{4}{3} y$ and $y = \dfrac{3}{8} z$, find the values of x, y, z.

Q.17 Two lines AB and CD intersect at O. If ∠AOC + ∠COB + ∠BOD = 270º, find the measures of ∠AOC, ∠COB, ∠BOD, ∠DOA.

Q.18 If the bisectors of angles ∠ABC and ∠ACB of a triangle ABC meet at a point O, then prove that $\angle BOC = 90º + \dfrac{1}{2} A$.
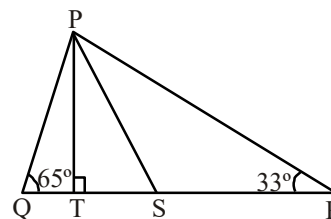
Q.19 If two parallel lines are intersected by a transversal, prove that the bisectors of the two pairs of interior angles enclose a rectangle.

Q.20 The angles of a triangle are arranged in ascending order of magnitude. If the difference between two consecutive angles is 10º, find all the three angles.
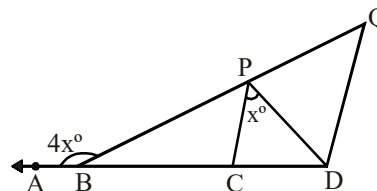
Q.21 In a ΔABC, ∠ABC = ∠ACB and the two bisectors of ∠ABC and ∠ACB intersect at O such that ∠BOC = 120º. Show that ∠A = ∠B = ∠C = 60º.

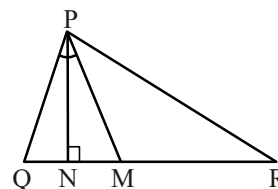**Q.22** In figure, PT ⊥ QR and PS bisects ∠QPR. If ∠Q = 65º and ∠R = 33º, find ∠TPS.

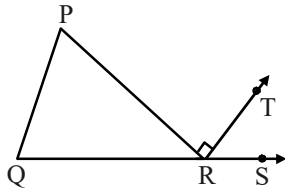**Q.23** In figure, ABCD and BPQ are lines. BP = BC and DQ ∥ CP. Prove that
(i) CP = CD (ii) DP bisects ∠CDQ.

Q.24 ABCDE is a regular pentagon. Find each angle of ΔBDE.

Q.25 In figure ∠Q > ∠R and M is a point QR such that PM is the bisector of ∠QPR. If the perpendicular from P on QR meets QR at N, then prove that $\angle MPN = \dfrac{1}{2} (\angle Q - \angle R)$.
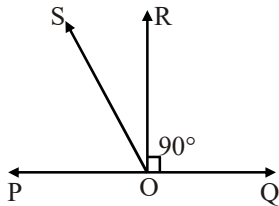
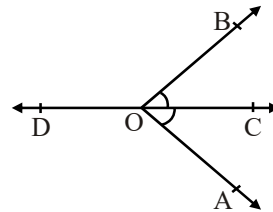**Q.26** In figure side QR of ∠PQR has been produced to S, if ∠P : ∠Q : ∠R = 3 : 2 : 1 and RT ⊥ PR, find ∠TRS.

Q.27 If the angles of a triangle are in the ratio 2 : 3 : 4, find the three angles.

Q.28 In figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that
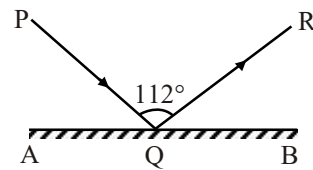
$$\angle ROS = \frac{1}{2}(\angle QOS - \angle POS).$$

Q.29 In the given figure, ray OC is the bisector of ∠AOB and OD is the ray opposite to OC. Show that ∠AOD = ∠BOD.

Q.30 In the given figure, AB is a mirror, PQ is the incident ray and QR, the reflected ray. If ∠PQR = 112°, find ∠PQA.

ANSWER KEY

A. VERY SHORT ANSWER TYPE QUESTIONS:

2. 40º

3. 20°

4. (i) 70°, (ii) 105°

5. a = 130°, b = 50°

6. (i) y = 60°, (ii) x = 70°

7. ∠AOC = 35°, ∠COF = 105°

8. ∠130°, ∠130°, ∠130°

9. 50°

10. x = 130°, y = 50°

11. y = 35°, z = w = 145°

B. SHORT ANSWER TYPE QUESTIONS :

13. ∠AED = 34°, ∠PDQ = 68°, ∠DEF = 68°

16. x = 48°, y = 36°, z = 96°

17. 90°

20. 50°, 60°, 70°

C. LONG ANSWER TYPE QUESTIONS :

22. 16°

24. ∠EBD = 36°, ∠BED = ∠BDE = 72°

26. ∠TRS = 60°

27. 40°, 60°, 80°

30. ∠PQA = 34°

EXERCISE # 2

Q.1 At 4.24 pm, how many degrees has the hour hand of a clock moved from its position at noon?
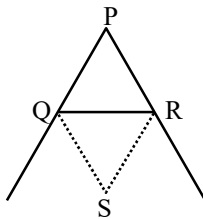
Q.2 Define adjacent angles.

Q.3 Find the sum of all interior angles of hexagon.

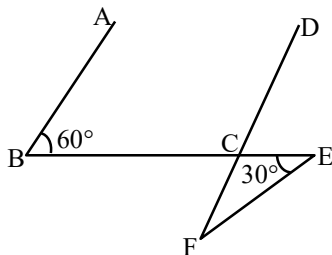**Q.4** Find the sum of all interior angles of pentagon.

Q.5 If a angle is three times as large as its complement then find it.

Q.6 In given figure, QS and RS are beisectors of exterior angles Q and R. Then find $\angle QSR + \angle P/2$.
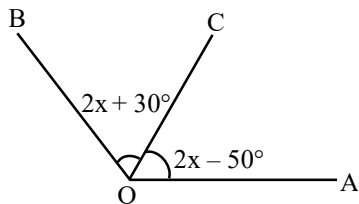

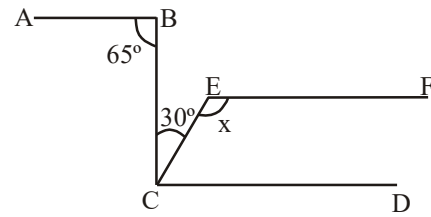**Q.7** Find the angle which exceeds its complement by 20°.
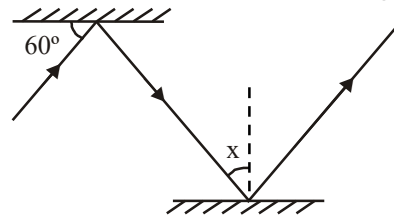
Q.8 In the figure AB || CD, then find $\angle EFD$.
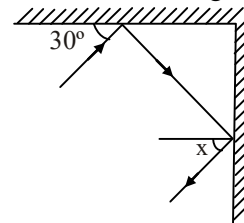

Q.9 What value of x will make AOB a straight line ?

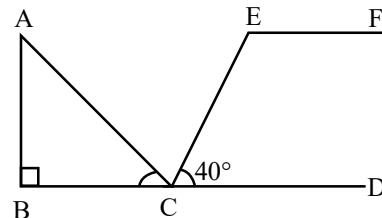**Q.10** What value of x will make CD || EF, if AB || CD?

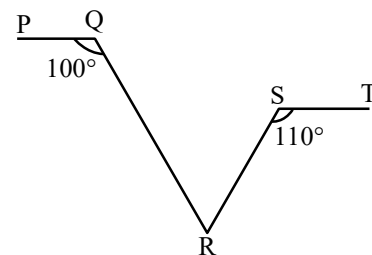
Q.11 Find the value of x in the following figure ?
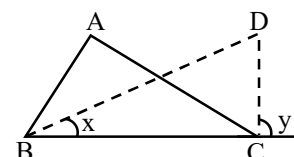

Q.12 Find the value of x in the given figure.

Q.13 In the figure if BD || EF, then find $\angle CEF$.

Q.14 In the figure PQ || ST, then find $\angle QRS$.

Q.15 In the adjoining figure, BD and CD are angle bisectors. Then, find the relation between $\angle D$ & $\angle A$.

ANSWER KEY

1. 132°

2. They lie in the same plane and have a common vertex, they have a ray in common, the intersection of their interiors is empty.

3. 720° **4.** 540° **5.** 67.5º

6. 90º **7.** 55º **8.** 30º

9. 50º **10.** 145º **11.** 30º

12. 30º **13.** 140º **14.** 30º

15. $\angle D = \dfrac{1}{2} \angle A$