EXERCISE

Q.1 Two opposite angles of a parallelogram are $(3x - 2)°$ and $(50 - x)°$. Find the measure of each angle of the parallelogram.

Q.2 If an angle of a parallelogram is two-third of its adjacent angle, find the angles of the parallelogram.

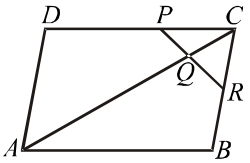
Q.3 Find the measure of all the angles of a parallelogram, if one angle is 24° less than twice the smallest angle.

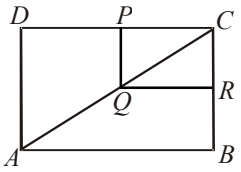
Q.4 The perimeter of a parallelogram is 22 cm. If the longer side measures 6.5 cm what is the measure of the shorter side?

Q.5 In a parallelogram ABCD, $\angle D = 135°$, determine the measures of $\angle A$ and $\angle B$.

Q.6 ABC is a triangle. D is a point on AB such that $AD = \frac{1}{4} AB$ and E is a point on AC such that $AE = \frac{1}{4} AC$. Prove that $DE = \frac{1}{4} BC$.

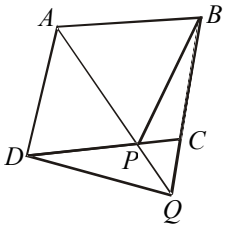
Q.7 In fig. ABCD is a parallelogram in which P is the mid-point of DC and Q is a point on AC such that $CQ = \frac{1}{4} AC$. If PQ produced meets BC at R, prove that R is a mid-point of BC.





Q.8 ABCD is a parallelogram, E and F are the mid-points of AB and CD respectively. GH is any line intersecting AD, EF and BC at G, P and H respectively. Prove that GP = PH.

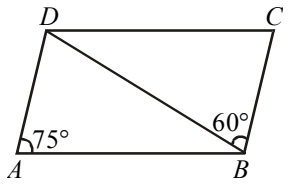
Q.9 In the figure, ABCD is a parallelogram and a line through A cuts DC at P and BC produced at Q. Prove that arc (ΔBPC) = arc (ΔDPQ)



Q.10 If one angle of a parallelogram is 24°less than twice the smallest angle, then find the largest angle of the parallelogram.

Q.11 If an angle of a parallelogram is two-third of its adjacent angle, then find smallest angle of the parallelogram.

Q.12 In the given figure, ABCD is a parallelogram in which $\angle DAB = 75°$ and $\angle DBC = 60°$ Then find $\angle BDC$.



Q.13 Two parallelograms stand on equal bases and between the same parallels. Then find ratio of their areas.

Q.14 If a rectangle and a parallelogram are equal in area and have the same base and are situated on the same side, then the quotient:

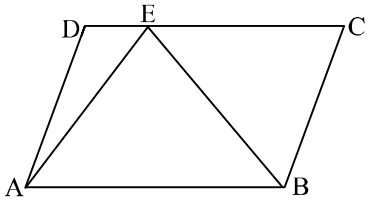
$$\frac{\text{Perimeter of rectangle}}{\text{Perimeter of } \| \text{ gm}}$$

Q.15 ABCD is a parallelogram, E, F are the mid points of BC and AD respectively and G is any point on EF. Then find area of ΔGAB.

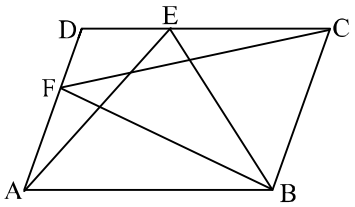
Q.16 P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD. Show that ar (APB) = ar (BQC).

Q.17 The altitude of a parallelogram is twice the length of the base and its area is 1250 cm^2. Then find lengths of the base and the altitude.

Q.18 In the figure if area of parallelogram ABCD is 30 cm^2, then find ar (ADE) + ar (BCE).



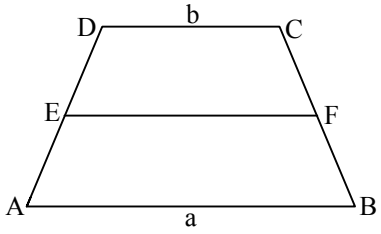
Q.19 In the figure, ABCD is a parallelogram, if area of ΔAEB is 16 cm^2, then find area of ΔBFC.



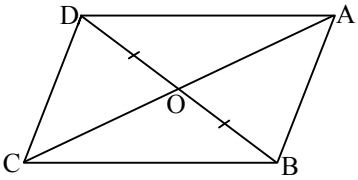
Q.20 If the ratio of the altitude and the area of the parallelogram is 2 : 11, then find the length of the base of the parallelogram.

Q.21 Two adjacent sides of a parallelogram are 24 cm and 18 cm. If the distance between the longer sides is 12 cm, then find the distance between the shorter sides.

Q.22 ABCD is a trapezium with parallel sides AB = a cm and DC = b cm. E and F are the mid-points of the non-parallel sides. Then find ratio of ar (ABFE) and ar (EFCD).



Q.23 In figure, diagonals AC and BD of quadrilateral ABCD, intersect at O such that OB = OD. If AB = CD. then show that :



(i) ar (DOC) = ar (AOB)

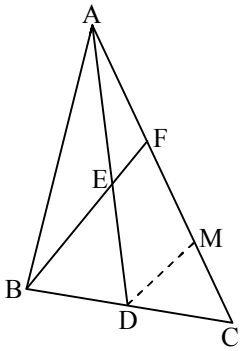
(ii) ar (DCB) = ar (ACB)

(iii) DA || CD or ABCD is a parallelogram

Q.24 The area of a triangle is equal to the area of a rectangle whose length and breadth are 18 cm and 12 cm respectively. If the base of the triangle is 24 cm, then find its altitude.

Q.25 In figure, ABC is a triangle, AD is a median and E is the mid-point of AD.BE is joined and produced to intersect AC in a point F. Prove that :

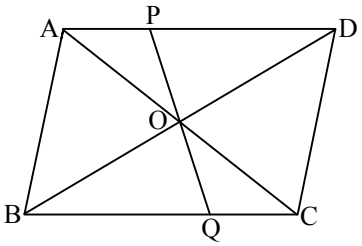
$$AF = \left(\frac{1}{3}\right) AC$$



Q.26 ABC is triangle right-angled at B and P is the mid-point of AC. Prove that :

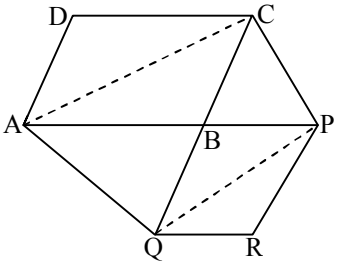
$PB = PA = \frac{1}{2} AC$

Q.27 The diagonals of a parallelogram ABCD intersect at a point O. Through O, a line is drawn to intersect AD at P and BC at Q. Show that PQ divides the parallelogram into two parts of equal area. (See figure)



Q.28 ABCD is a quadrilateral. A line through D, parallel to AC meets BC produced in P. Prove that area of ΔABP = area of quad. ABCD.

Q.29 In figure, ABCD is a parallelogram, P is any point on AB produced, AQ is drawn parallel to CP to intersect CB produced at Q and parallelogram BQRP is completed. Show that area of ||gm ABCD = area BQRP.



➢ True/False Type Questions

Q.30 In a parallelogram, the diagonals are equal.

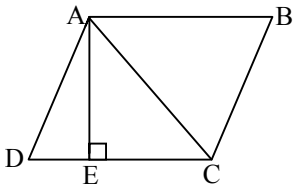
Q.31 In a parallelogram, the diagonals bisect each other.

Q.32 In a parallelogram, the diagonals intersect each other at right angles.

Q.33 If ABCD is a parallelogram with two adjacent angles A and B equal to each other, then the parallelogram is a rectangle.

Q.34 If ABCD is a parallelogram and E, F are the centroids of Δ s ABD and BCD respectively, then EF = AE.

Q.35 ABCD is a parallelogram one of whose diagonals is AC. Then ar (ΔADC) = ar (ΔCBA)



➢ Fill in the blanks Types Questions

Q.36 Fill in the blanks :

(i) The triangle formed by joining the mid-points of the sides of an isosceles triangle is …… .

(ii) The triangle formed by joining the mid-points of the sides of a right triangle is …….. .

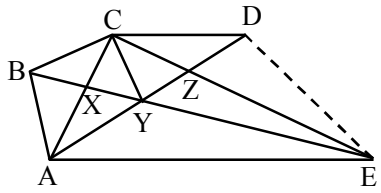
(iii) The figure formed by joining the mid-points of the consecutive sides of a quadrilateral is ……

Q.37 In figure CD || AE and CY || BA.

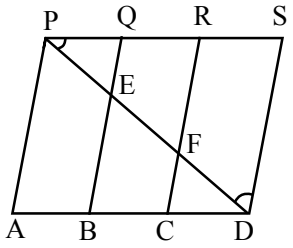
(i) Name a triangle equal in area of ΔCBX

(ii) Prove that ar(ΔZDE) = ar(ΔCZA)

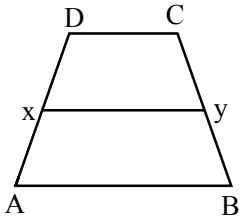
(iii) Prove that ar(BCZY) = ar(ΔEDZ)



Q.38 In figure PSDA is a parallelogram in which PQ = QR = RS and AP || BQ || CR. Prove that ar(ΔPQE) = ar(ΔCFD).



Q.39 In figure ABCD is a trapezium in which AB || DC and DC = 40 cm and AB = 60 cm. If X and Y are, respectively, the mid-point of AD and BC, prove that :



(i) XY = 50 cm

(ii) DCYX is a trapezium

(iii) ar(trap. DCYX) = $\frac{9}{11}$ ar(trap. (XYBA))

Q.40 D is the mid-point of side BC of ΔABC and E is the mid-point of BD. If O is the mid-point of AE, prove that ar(ΔBOE) = $\frac{1}{8}$ ar(ΔABC).

ANSWER KEY

1. 37°, 143°, 37°, 143° **2.** 108°, 72°, 108°, 72° **3.** 68°, 112°,68°, 112° 4.45 cm

4. $\angle A = 45°$, $\angle B = 135°$ **10.** 112º **11.** 72º

12. 45° **13.** 1 : 1 **14.** Less than 1

15. $\frac{1}{4}$ (||gm ABCD) **17.** 25 cm, 50 cm **18.** 15 cm^2

19. 16 cm^2 **20.** 5.5 units **21.** 16 cm

22. (3a + b) : (a + 3b) **24.** 18 cm **30.** Flase

31. True **32.** Flase **33.** True

34. True **35.** True

3**6.** (i) Also isosceles Δ (ii) Also right angle Δ (iii) Parallelograme