

SEE CAPSULE-2082

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(Compulsory Mathematics)

DAY-5

SEE Q. No. 11

1. In the given figure, $\square ABCD$, $\square EBCF$ and $\triangle FBC$ are on the same base BC and between the same parallel lines AF and BC.

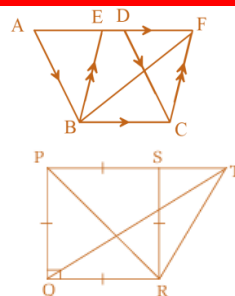
(a) Write the relation between the area of $\square ABCD$ and $\square EBCF$. [1K]

(b) Prove that: Area of $\triangle FBC = \frac{1}{2}$ area of $\square ABCD$. [2U]

(c) In the figure, square PQRS and $\triangle QRT$ are standing on the same base BC and between the same parallels.

If $AC = 6\sqrt{2}$ cm, find the area of $\triangle QRT$. [2A]

Ans: (a) $\square ABCD$ and $\square EBCF$ are equal in area (c) 18 cm^2

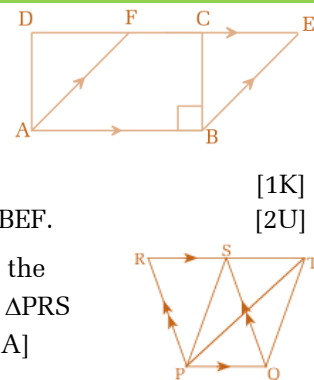


2. In the given figure, rectangle ABCD and parallelogram ABEF are on the same base AB and between the same parallels DE and AB.

(a) Write a property which is common to a rectangle and a parallelogram. [1K]

(b) Prove that area of rectangle ABCD = area of parallelogram ABEF. [2U]

(c) In the figure, parallelogram PQSR and $\triangle PQT$ are standing on the same base and between the same parallel lines. If the area of $\triangle PRS$ is 45 cm^2 . Find the area of $\triangle PQT$. [2A]



Ans: (a) Both have opposite sides equal. (c) 45 cm^2

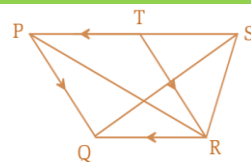
3. In the given figure, $\triangle PQR$, $\triangle QRS$ and $\square PQRT$ are on the same base QR and between the same parallel lines PS and QR.

(a) What is the relationship between the areas of $\triangle QRS$ and $\square PQRT$? [1K]

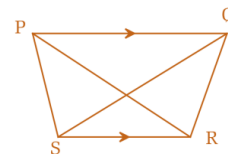
(b) Prove that Area of $\triangle PQR$ = Area of $\triangle QRS$. [2U]

(c) If the area of trapezium PQRS is 100 cm^2 and the area of triangle RST is 20 cm^2 , find the area of triangle QRS. [2A]

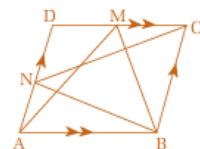
Ans: (a) The area of $\triangle QRS$ is half of the area of $\square PQRT$ (c) 40 cm^2



4. In the given figure, there are two triangles PSR and QSR on the same base SR and between same parallel lines PQ and SR.

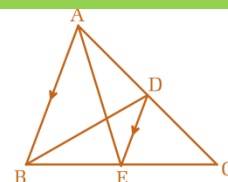


- Name the triangle which is equal in area to the ΔPQS . [1K]
- Prove that: Area of ΔPSR = Area of ΔQSR . [2U]
- In the given figure, ABCD is a parallelogram. M and N are any points on CD and DA respectively. Prove that the areas of ΔAMB ΔBNC are equal. [2HA]



Ans: (a) ΔPQR

5. In the given figure, $AB \parallel DE$ and AE is the median.

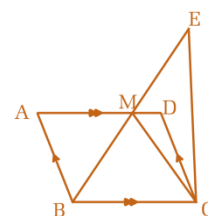


- Which triangle is equal in area to the triangle ABD? [1K]
- If the area of triangle AEC is 50 cm^2 , what is the area of triangle ABD? [1U]
- Prove that area of triangles AEC and BCD are equal. [2HA]

Ans: (a) ΔABE

(b) 50 cm^2

6. In the given figure, ABCD is a parallelogram and M is the mid-point of BE.

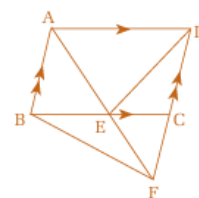


- What is the area of triangle BMC if the area of parallelogram ABCD is 36 cm^2 ? [1U]
- Prove that: area of ΔBCE = the area of parallelogram ABCD. [2HA]
- Construct a triangle which is equal in area with the triangle ABC having $BC = 4.4 \text{ cm}$, $AB = 5 \text{ cm}$ and $\angle ABC = 60^\circ$. Also, construct another triangle PBC equal in area to the triangle ABC having $\angle PBC = 120^\circ$. [3A]

Ans: (a) 18 cm^2

(b) 64 cm^2

7. In the adjoining parallelogram ABCD, A is joined to any point E on BC. AE and DC produced meet at F.

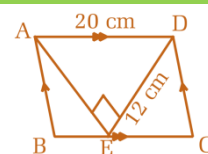


- What is the relation between the area of triangle AED and parallelogram ABCD? [1K]
- If the area of triangle AED is 64 square centimeters, find the area of triangle ABF. [2U]
- Prove that the area of ΔBEF = the area of ΔCDE . [2HA]

Ans: (a) $\Delta AED = \frac{1}{2}$ Parm. ABCD

(b) 64 cm^2

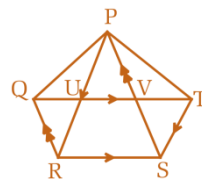
8. A parallelogram ABCD and a triangle ADE are on the same base AD and between the same parallel lines AD and BC, where $\angle BED = 90^\circ$, $AD = 20 \text{ cm}$ and $ED = 12 \text{ cm}$.



- What is the area of parallelogram BCED? Find it. [2U]
- Theoretically prove that the relationship between the area of the parallelogram ABCD and triangle AED. [2U]
- Construct a triangle ABC, where $AC = 5 \text{ cm}$, $AB = 4 \text{ cm}$ and $\angle BAC = 45^\circ$. Also construct a parallelogram ADMN whose area is equal to the area of the triangle. [3A]

9. In the adjoining figure, $QT \parallel RS$, $PR \parallel TS$ and $QR \parallel PS$.

- (a) Write a pair of parallelograms which are equal in area. [1K]
 (b) Prove that: area of ΔPQR = area of ΔPST . [2HA]
 (c) Construct a parallelogram ABCD having $AB = 4$ cm, $BC = 5.5$ cm and $\angle ABC = 60^\circ$. Also, construct another parallelogram ABQP whose area is equal to the area of parallelogram ABCD and having one side 6 cm. [3A]

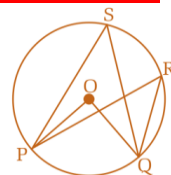


Ans: (a) Parallelograms QRSV and URST

SEE Q. No. 12

1. In a circle with centre O, central angle POQ and circumference angles PRQ and PSQ are drawn on the arc PQ.

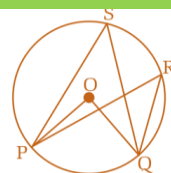
- (a) Write the relation between $\angle POQ$ and $\angle PRQ$. [1K]
 (b) If $\angle POQ = 5x^\circ$ and $\angle PSQ = (x + 27)^\circ$, find the measure of $\angle PSQ$. [1U]
 (c) Experimentally verify the relation between $\angle PSQ$ and $\angle PRQ$. (At least two circles with radii 3 cm are necessary). [2A]



Ans: (a) $\angle POQ = 2\angle PRQ$ (b) 45°

2. In a circle with centre O, central angle POQ and circumference angles PRQ and PSQ are drawn on the arc PQ.

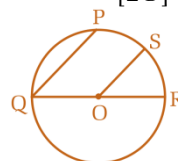
- (a) Write the relation between $\angle PSQ$ and $\angle PRQ$. [1K]
 (b) If $\angle SPR = (x + 20)^\circ$ and $\angle SQR = (2x + 15)^\circ$, find the value of x. [1U]
 (c) Experimentally verify the relation between $\angle POQ$ and $\angle PSQ$. (At least two circles with radii 3 cm are necessary). [2A]



Ans: (a) $\angle POQ = 2\angle PRQ$ (b) 5°

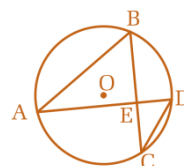
3. In a circle with centre O, central angle AOB and inscribed angle ACB are on the arc AB.

- (a) Define inscribed angle. [1K]
 (b) Prove that: $\angle AOB = 2\angle ACB$. [2U]
 (c) In the adjoining figure, O is the centre of the circle. If arc PS = arc SR, prove that $PQ \parallel OS$. [2HA]



4. In a circle with centre O, inscribed angles LMN and LPN are on the arc LN.

- (a) How is an inscribed angle formed? [1K]
 (b) Prove theoretically that: $\angle LMN = \angle LPN$. [2U]
 (c) In the adjoining figure, A, B, C and D are four points on the circumference of the circle. The chords AC and BD are intersecting at a point E. If $\angle BED = 110^\circ$ and $\angle BCD = 40^\circ$, find the value of $\angle ABC$.

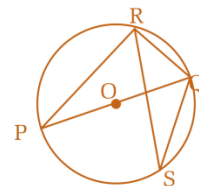


Ans: (a) Formed by two chords at a point on circumference

(c) 70°

5. In the figure, O is the centre of circle and PQ is a diameter.

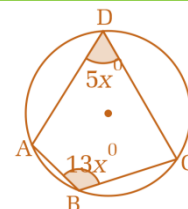
- (a) What is the measure of $\angle PRQ$? [1K]
 (b) If $\angle PQR : \angle QPR = 3 : 2$, find the value of $\angle QSR$. [1U]
 (c) Explore experimentally the measure of $\angle PRQ$.
 (Two circles of radii at least 3 cm are necessary). [2A]



Ans: (a) 90° (b) 36°

6. In the given cyclic quadrilateral ABCD; $\angle B = 13x^\circ$ and $\angle D = 5x^\circ$.

- (a) Write the relation between $\angle ABC$ and $\angle ADC$. [1K]
 (b) Find the measure of $\angle ABC$. [1U]
 (c) Draw two circles of radii at least 3 cm and draw a cyclic quadrilateral of different shapes in each circle then experimentally verify the relation between $\angle ABC$ and $\angle ADC$. [2A]



Ans: (a) $\angle ABC + \angle ADC = 180^\circ$ (b) 130°

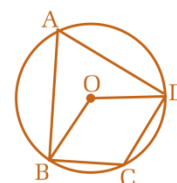
7. WXYZ is a cyclic quadrilateral.

- (a) Write the relation between $\angle WXY$ and $\angle WZY$. [1K]
 (b) Verify experimentally that the relationship between $\angle XYZ$ and $\angle XWZ$. (Two circles having radii at least 3 cm are necessary.) [2U]
 (c) If the cyclic quadrilateral WXYZ is a parallelogram, find the value of $\angle XYZ$. [1A]

Ans: (a) $\angle WXY + \angle WZY = 180^\circ$ (c) 90°

8. In the given figure, ABCD is a cyclic quadrilateral.

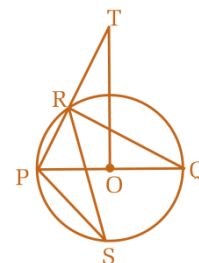
- (a) Write the relation of $\angle BCD$ and $\angle BAD$. [1K]
 (b) Prove that $\angle BAD = \frac{1}{2} \angle BOD$. [2U]
 (c) If $\angle BOD = 120^\circ$, what is the value of $\angle BCD$? [1A]



Ans: (a) 90° (c) 120°

9. In the given figure, O is the centre of the circle and PQ is a diameter. P, S, Q and R are the circumference points and T is an external point such that TO is perpendicular to PQ.

- (a) What is the measurement of angle $\angle PRQ$? [1K]
 (b) Prove that: $\angle OTP = \angle PSR$. [2HA]
 (c) If $\angle OTP = 30^\circ$, what is the measurement of $\angle PSR$? [1A]



Ans: (a) 90° (c) 30°

SEE Q. No. 13

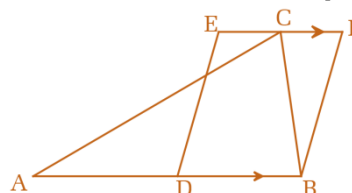
1. (a) Construct a parallelogram ABCD having $AB = 5$ cm, $BC = 6.5$ cm and $\angle ABC = 60^\circ$. Also, construct another parallelogram ABQP whose area is equal to the area of parallelogram ABCD and having one side 7 cm. [3A]
 (b) Why is the area of parallelogram ABCD equal to the area of parallelogram ABQP? Give reason. [1HA]

Ans: (b) Being both standing on the same base and between the same parallel lines

2. (a) Construct a triangle ABC having $AB = 4.5$ cm, $BC = 5.7$ cm and $\angle ABC = 75^\circ$. Also, construct another triangle BCD whose area is equal to the area of triangle ABC having $\angle BCD = 120^\circ$. [3A]
 (b) How is $AD \parallel BC$? Give reason. [1HA]

Ans: (b) Being alternate angles equal

3. (a) Construct a triangle ABC having $AB = 6$ cm, $BC = 7$ cm and $AC = 6.5$ cm. Construct a parallelogram CDEF equal in area to the triangle ABC. [3A]
 (b) In the figure, D is the mid-point of AB. Are the areas of triangle ABC and parallelogram ABCD equal? Write with reason. [1HA]



Ans: (b) Being base of triangle double the base of parallelogram and between the same parallel lines

4. (a) Construct a parallelogram ABCD in which $AB = 5$ cm, $BC = 4$ cm and $\angle ABC = 60^\circ$. Also, construct a $\triangle BEF$ with a side $PB = 6$ cm and equal in area to the $\square ABCD$. [3A]
 (b) Write the reason for being the area of triangle BEF equal to the area of parallelogram ABCD. [1HA]

Ans: (b) Being base of triangle double the base of parallelogram and between the same parallel lines

5. In a triangle ABC, $a = 10$ cm, $b = 8$ cm and $c = 6$ cm.

- (a) Construct the triangle ABC. Also, construct a rectangle which is equal to the area of triangle ABC. [3A]
 (b) Measure the height of rectangle then find the area of triangle ABC. [1HA]

Ans: (b) 12 cm^2

6. (a) Construct a quadrilateral PQRS in which $PQ = QR = 5.5$ cm, $RS = SP = 4.5$ cm and $\angle SPQ = 75^\circ$. Also, construct a triangle PST equal in area to the quad. PQRS. [3A]
 (b) Why are the quadrilateral PQRS and triangle PST equal in area? Give reason. [1HA]

Ans: (b) (i) $\triangle QRS = \triangle QTS$ (ii) $\triangle QRS + \triangle PQS = \triangle QTS + \triangle PQS$ (iii) Quad. PQRS = $\triangle PST$

7. In a quadrilateral ABCD, $AB = 4.5$ cm, $BC = 5.5$ cm, $CD = 5.7$ cm and $DA = 4.9$ cm and diagonal $BD = 5.9$ cm.

- (a) Construct a quadrilateral ABCD. Also, construct a triangle DAE equal in area to the quad. PQRS. [3A]
 (b) In the construction (a), which two triangles are equal in area? Write with reason. [1HA]

Ans: (b) $\triangle BDC$ and $\triangle BDE$ or, $\triangle CDE$ and $\triangle CEB$

8. In a parallelogram PQRS, $PQ = 5$ cm, diagonal $PR = 6$ cm, and diagonal $QS = 8$ cm.

- (a) Construct a parallelogram PQRS. Also, construct a triangle PSA whose area is equal to the area of the parallelogram. [3A]
 (b) Write with reason why the $\square PQRS$ and triangle PSA are equal in area? [1HA]

Ans: (b) The base of triangle is double the base of parallelogram