

# SEE CAPSULE-2082

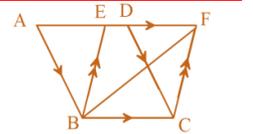
Prepared by Tara Bdr. Magar

(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  $BC$ .

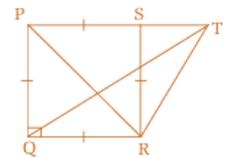


(a) Write the relation between the area of  $\square ABCD$  and  $\square EBCF$ . [1K]

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

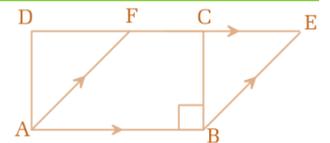
(c) In the figure,  $AE \parallel BC$ , square  $ABCD$  and  $\triangle EBC$  are standing on the same base  $BC$  and between the same parallels.

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)  $18 \text{ cm}^2$

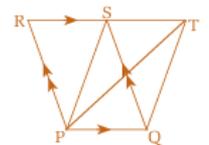
2. In the given figure, rectangle  $ABCD$  and parallelogram  $ABEF$  are on the same base  $AB$  and between the same parallels  $DE$  and  $AB$ .



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

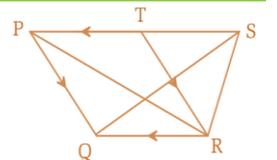
(b) Prove that area of rectangle  $ABCD =$  area of parallelogram  $ABEF$ . [2U]

(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  $45 \text{ cm}^2$ . Find the area of  $\triangle PQT$ . [2A]



Ans: (a) Both have opposite sides equal. (c)  $45 \text{ cm}^2$

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  $QR$ .



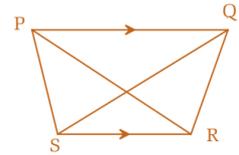
(a) What is the relationship between the areas of  $\triangle QRS$  and  $\square PQRT$ ? [1K]

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

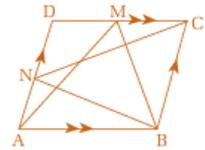
(c) If the area of trapezium  $PQRS$  is  $100 \text{ cm}^2$  and the area of triangle  $RST$  is  $20 \text{ cm}^2$ , find the area of triangle  $QRS$ . [2A]

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

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.

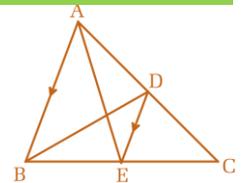


- Name the triangle which is equal in area to the  $\Delta PQS$ . [1K]
- Prove that: Area of  $\Delta PSR = \text{Area of } \Delta QSR$ . [2U]
- In the given figure, ABCD is a parallelogram. M and N are any points on CD and DA respectively. Prove that the areas of  $\Delta AMB$  and  $\Delta BNC$  are equal. [2HA]



Ans: (a)  $\Delta PSR$

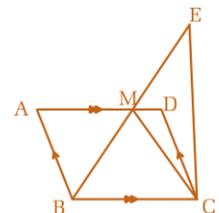
5. In the given figure,  $AB \parallel DE$  and AE is the median.



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

Ans: (a)  $\Delta ABE$  (b)  $50 \text{ cm}^2$

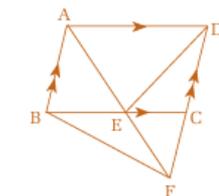
6. In the given figure, ABCD is a parallelogram and M is the mid-point of BE.



- What is the area of triangle BMC if the area of parallelogram ABCD is  $36 \text{ cm}^2$ ? [1U]
- Prove that: area of  $\Delta BCE = \text{the area of parallelogram ABCD}$ . [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)  $18 \text{ cm}^2$  (b)  $64 \text{ cm}^2$

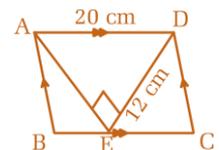
7. In the adjoining parallelogram ABCD, A is joined to any point E on BC. AE and DC produced meet at F.



- 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  $\Delta BEF = \text{the area of } \Delta CDE$ . [2HA]

Ans: (a)  $\Delta AED = \frac{1}{2}$  Parm. ABCD (b)  $64 \text{ cm}^2$

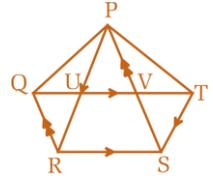
8. A parallelogram ABCD and a triangle ADE are on the same base AD and between the same parallel lines AD and BC, where  $\angle BED = 90^\circ$ ,  $AD = 20 \text{ cm}$  and  $ED = 12 \text{ cm}$ .



- 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  $\Delta PQR$  = area of  $\Delta PST$ . [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)  $18^\circ$

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

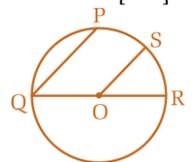
- (a) Write the relation between  $\angle PSQ$  and  $\angle PRQ$ . [1K]
- (b) If  $\angle SPR = (x + 20)^\circ$  and  $\angle SQR = (2x + 15)^\circ$ , find the value of x. [1U]
- (c) Experimentally verify the relation between  $\angle POQ$  and  $\angle PSQ$ . (At least two circles with radii 3 cm are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



Ans: (a)  $\angle POQ = 2\angle PRQ$  (b)  $18^\circ$

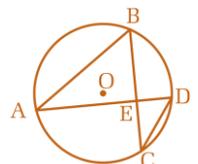
3. In a circle with centre O, central angle AOB and inscribed angle ACB are on the arc AB.

- (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.

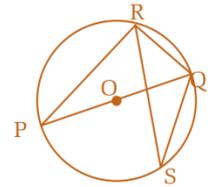
- (a) How is an inscribed angle formed? [1K]
- (b) Prove theoretically that:  $\angle LMN = \angle LPN$ . [2U]
- (c) In the adjoining figure, A, B, C and D are four points on the circumference of the circle. The chords AC and BD are intersecting at a point E. If  $\angle BED = 110^\circ$  and  $\angle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



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

(c)  $70^\circ$

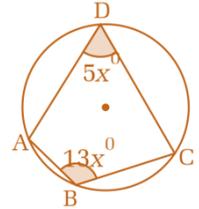
5. In the figure, O is the centre of circle and PQ is a diameter.



- (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  $\angle PRQ$ . [2A]  
 (Two circles of radii at least 3 cm are necessary).

**Ans:** (a)  $90^\circ$  (b)  $36^\circ$

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]

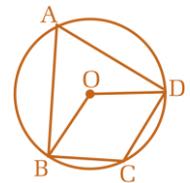
**Ans:** (a)  $\angle ABC + \angle ADC = 180^\circ$  (b)  $130^\circ$

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)  $\angle WXY + \angle WZY = 180^\circ$  (b)  $130^\circ$

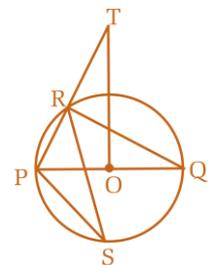
8. In the given figure, ABCD is a cyclic quadrilateral.



- (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)  $90^\circ$  (b)  $36^\circ$

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)  $90^\circ$  (c)  $30^\circ$

**SEE Q. No. 13**

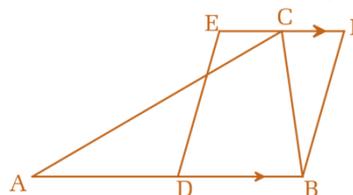
1. (a) Construct a parallelogram ABCD having  $AB = 5$  cm,  $BC = 6.5$  cm and  $\angle ABC = 60^\circ$ . Also, construct another parallelogram ABQP whose area is equal to the area of parallelogram ABCD and having one side 7 cm. [3A]  
 (b) Why is the area of parallelogram ABCD equal to the area of 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)  $12 \text{ cm}^2$

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