

# NCERT SOLUTIONS CLASS-8 MATHS

## CHAPTER-3 EXERCISE-3.3

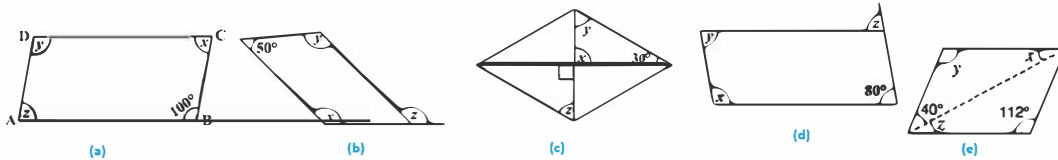
1. Given a parallelogram ABCD. Complete each statement along with the definition or property used.

- (i)  $AD = \dots\dots$       (ii)  $\angle DCB = \dots\dots$   
 (iii)  $OC = \dots\dots$       (iv)  $\angle DAB + \angle CDA = \dots\dots$

**Answer**

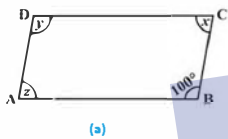
- (i)  $AD = BC$  (Opposite sides of a parallelogram are equal)  
 (ii)  $\angle DCB = \angle DAB$  (Opposite angles of a parallelogram are equal)  
 (iii)  $OC = OA$  (Diagonals of a parallelogram are equal)  
 (iv)  $m\angle DAB + m\angle CDA = 180^\circ$

2. Consider the following parallelograms. Find the values of the unknowns x, y, z.



**Answer**

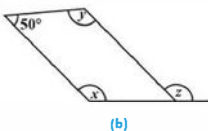
(a)



$y = 100^\circ$  (opposite angles of a parallelogram)  
 $x + 100^\circ = 180^\circ$  (Adjacent angles of a parallelogram)  
 $\Rightarrow x = 180^\circ - 100^\circ = 80^\circ$

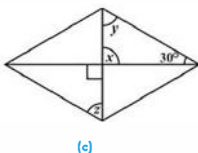
$x = z = 80^\circ$  (opposite angles of a parallelogram)  
 Thus,  $x = 80^\circ$ ,  $y = 100^\circ$  and  $y = 100^\circ$

(b)



$50^\circ + x = 180^\circ \Rightarrow x = 180^\circ - 50^\circ = 130^\circ$  (Adjacent angles of a parallelogram)  
 $x = y = 130^\circ$  (opposite angles of a parallelogram)  
 $x = z = 130^\circ$  (corresponding angle)

(c)



$$x = 90^\circ \text{ (vertical opposite angles)}$$

$$x + y + 30^\circ = 180^\circ \text{ (angle sum property of a triangle)}$$

$$\Rightarrow 90^\circ + y + 30^\circ = 180^\circ$$

$$\Rightarrow y = 180^\circ - 120^\circ = 60^\circ$$

$$\text{also, } y = z =$$

$$60^\circ$$

(alternate angles)

(d)



(d)

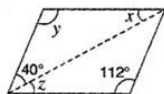
$$z = 80^\circ \text{ (corresponding angle)}$$

$$z = y = 80^\circ \text{ (alternate angles)}$$

$$x + y = 180^\circ \text{ (adjacent angles)}$$

$$\Rightarrow x + 80^\circ = 180^\circ \Rightarrow x = 180^\circ - 80^\circ = 100^\circ$$

(e)



(e)

$$y = 112^\circ \text{ [Opposite angles are equal in a parallelogram]}$$

$$40^\circ + y + x = 180^\circ \quad 40^\circ + 112^\circ + x = 180^\circ \quad 152^\circ + x = 180^\circ \quad x = 180^\circ - 152^\circ = 28^\circ$$

$$\text{and } z = x = 28^\circ \quad \text{[Alternate angles]}$$

**3. Can a quadrilateral ABCD be a parallelogram if**

(i)  $\angle D + \angle B = 180^\circ$ ?      (ii)  $AB = DC = 8 \text{ cm}$ ,  $AD = 4 \text{ cm}$  and  $BC = 4.4 \text{ cm}$ ?

(iii)  $\angle A = 70^\circ$  and  $\angle C = 65^\circ$ ?

**Answer**

(i) Yes, a quadrilateral ABCD be a parallelogram if  $\angle D + \angle B = 180^\circ$  but it should also fulfilled some conditions which are:

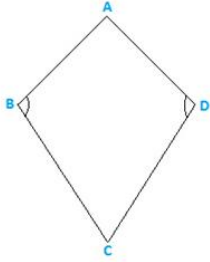
The sum of the adjacent angles should be  $180^\circ$

Opposite angles must be equal.

(ii) No, opposite sides should be of same length. Here,  $AD \neq BC$

(iii) No, opposite angles should be of same measures.  $\angle A \neq \angle C$

4. Draw a rough figure of a quadrilateral that is not a parallelogram but has exactly two opposite angles of equal measure. Remove Watermark Now



**Answer**

ABCD is a figure of quadrilateral that is not a parallelogram but has exactly two opposite angles that is  $\angle B = \angle D$  of equal measure. It is not a parallelogram because  $\angle A \neq \angle C$

5. The measures of two adjacent angles of a parallelogram are in the ratio 3 : 2. Find the measure of each of the angles of the parallelogram.

**Answer**

Let the measures of two adjacent angles  $\angle A$  and  $\angle B$  be  $3x$  and  $2x$  respectively in parallelogram ABCD.

$$\angle A + \angle B = 180^\circ$$

$$\Rightarrow 3x + 2x = 180^\circ$$

$$\Rightarrow 5x = 180^\circ$$

$$\Rightarrow x = 36^\circ$$

We know that opposite sides of a parallelogram are equal.

$$\angle A = \angle C = 3x = 3 \times 36^\circ = 108^\circ$$

$$\angle B = \angle D = 2x = 2 \times 36^\circ = 72^\circ$$

6. Two adjacent angles of a parallelogram have equal measure. Find the measure of each of the angles of the parallelogram.

**Answer**

Let ABCD be a parallelogram.

Sum of adjacent angles of a parallelogram =  $180^\circ$

$$\angle A + \angle B = 180^\circ$$

$$\Rightarrow 2\angle A = 180^\circ$$

$$\Rightarrow \angle A = 90^\circ$$

$$\text{also, } 90^\circ + \angle B = 180^\circ$$

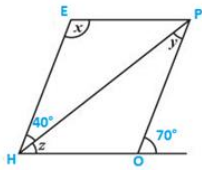
$$\Rightarrow \angle B = 180^\circ - 90^\circ = 90^\circ$$

$$\angle A = \angle C = 90^\circ$$

$$\angle B = \angle D = 90^\circ$$

7. The adjacent figure HOPE is a parallelogram. Find the angle measures  $x$ ,  $y$  and  $z$ . State the properties you use to find them.

**Answer**



$$y = 40^\circ \text{ (alternate interior angle)}$$

$$\angle P = 70^\circ \text{ (alternate interior angle)}$$

$$\angle P = \angle H = 70^\circ \text{ (opposite angles of a parallelogram)}$$

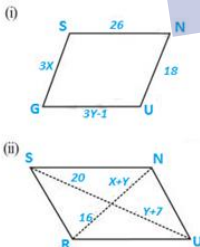
$$z = \angle H - 40^\circ = 70^\circ - 40^\circ = 30^\circ$$

$$\angle H + x = 180^\circ$$

$$\Rightarrow 70^\circ + x = 180^\circ$$

$$\Rightarrow x = 180^\circ - 70^\circ = 110^\circ$$

8. The following figures GUNS and RUNS are parallelograms. Find  $x$  and  $y$ . (Lengths are in cm)



**Answer**

(i)  $SG = NU$  and  $SN = GU$  (opposite sides of a parallelogram are equal)

$$3x = 18$$

$$\Rightarrow x = 18/3 = 6$$

$$3y - 1 = 26 \text{ and,}$$

$$\Rightarrow 3y = 26 + 1$$

$$\Rightarrow y = 27/3 = 9$$

$$x = 6 \text{ and } y = 9$$

(ii)  $20 = y + 7$  and  $16 = x + y$  (diagonals of a parallelogram bisect each other)

$$y + 7 = 20$$

$$\Rightarrow y = 20 - 7 = 13 \text{ and,}$$

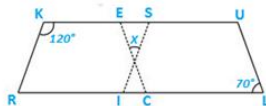
$$x + y = 16$$

$$\Rightarrow x + 13 = 16$$

$$\Rightarrow x = 16 - 13 = 3$$

$$x = 3 \text{ and } y = 13$$

9. In the below figure both RISK and CLUE are parallelograms. Find the value of x.



**Answer**

$\angle K + \angle R = 180^\circ$  (adjacent angles of a parallelogram are supplementary)

$$\Rightarrow 120^\circ + \angle R = 180^\circ$$

$$\Rightarrow \angle R = 180^\circ - 120^\circ = 60^\circ$$

also,  $\angle R = \angle SIL$  (corresponding angles)

$$\Rightarrow \angle SIL = 60^\circ$$

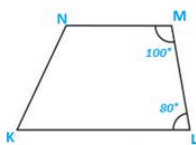
also,  $\angle ECR = \angle L = 70^\circ$  (corresponding angles)

$$x + 60^\circ + 70^\circ = 180^\circ \text{ (angle sum of a triangle)}$$

$$\Rightarrow x + 130^\circ = 180^\circ$$

$$\Rightarrow x = 180^\circ - 130^\circ = 50^\circ$$

10. Explain how this figure is a trapezium. Which of its two sides are parallel? (Fig 3.32)



**Answer**

When a transversal line intersects two lines in such a way that the sum of the adjacent angles on the same side of transversal is  $180^\circ$

then the lines are parallel to each other.

$$\text{Here, } \angle M + \angle L = 100^\circ$$

$$+ 80^\circ$$

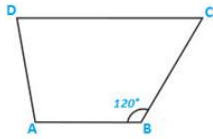
$$= 180^\circ$$

Thus,  $MN \parallel LK$

As the quadrilateral  $KLMN$  has one pair of parallel line therefore it is a trapezium.

$MN$  and  $LK$  are parallel lines.

11. Find  $m\angle C$  in Fig 3.33 if  $AB \parallel DC$  ?



**Answer**

$$m\angle C + m\angle B = 180^\circ$$

(angles on the same side of transversal)

$$\Rightarrow m\angle C + 60^\circ$$

$$= 180^\circ$$

$$\Rightarrow m\angle C = 180^\circ$$

$$- 60^\circ$$

$$= 120^\circ$$

12. Find the measure of  $\angle p$  and  $\angle S$  if  $SP \parallel RQ$  ? in Fig 3.34. (If you find  $m\angle R$ , is there more than one method to find  $m\angle p$  ?)



**Answer**

$$\angle p + \angle Q = 180^\circ$$

(angles on the same side of transversal)

$$\Rightarrow \angle p + 130^\circ = 180^\circ$$

$$\Rightarrow \angle p = 180^\circ$$

$$-130^\circ = 50^\circ$$

$$\text{also, } \angle R + \angle S = 180^\circ$$

(angles on the same side of transversal)

$$\Rightarrow 90^\circ + \angle S = 180^\circ$$

$$\Rightarrow \angle S = 180^\circ$$

$$- 90^\circ = 90^\circ$$

Thus,  $\angle p = 50^\circ$  and  $\angle S = 90^\circ$

Yes, there are more than one method to find  $m\angle p$ .

PQRS is a quadrilateral. Sum of measures of all angles is  $360^\circ$

Since, we know the measurement of  $\angle Q$ ,  $\angle R$  and  $\angle S$ .

$$\angle Q = 130^\circ, \angle R = 90^\circ \text{ and } \angle S = 90^\circ$$

$$\angle p + 130^\circ + 90^\circ + 90^\circ = 360^\circ$$

$$\Rightarrow \angle p + 310^\circ = 360^\circ$$

$$\Rightarrow \angle p = 360^\circ - 310^\circ = 50^\circ$$

pdfelement