

## CLASS NOTES-ANSWERS

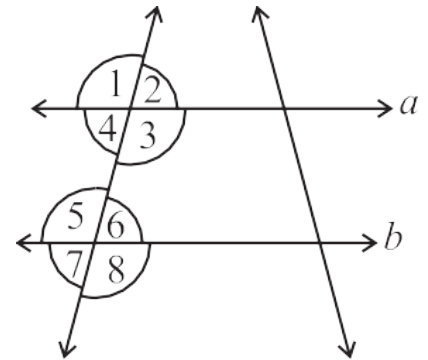
### EXERCISE 5.2

1. State the property that is used in each of the following statements?

i. If  $a \parallel b$ , then  $\angle 1 = \angle 5$ .

ii. If  $\angle 4 = \angle 6$ , then  $a \parallel b$ .

iii. If  $\angle 4 + \angle 5 = 180^\circ$ , then  $a \parallel b$ .

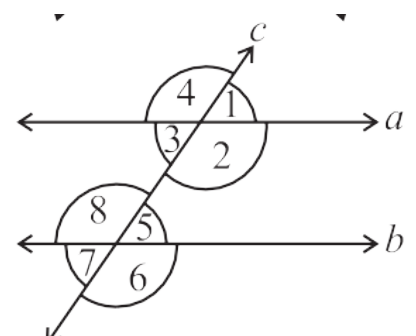


Answer:

- (i) If two parallel lines are intersected by a transversal, then each pair of corresponding angles are equal.
- (ii) When a transversal intersects two parallel lines such that if pair of alternate interior angles are equal then the lines are parallel.
- (iii) When a transversal intersects two parallel line such that pair of interior angles on the same side of transversal are supplementary, then the lines are parallel.

2. In the adjoining figure, identify

- i. the pairs of corresponding angles.
- ii. the pairs of alternate interior angles.
- iii. the pairs of interior angles on the same side of the transversal.
- iv. the vertically opposite angles.





Answer:

- (i)  $\angle 1$  and  $\angle 5$ ;  $\angle 2$  and  $\angle 6$ ;  $\angle 4$  and  $\angle 8$ ;  $\angle 3$  and  $\angle 7$
- (ii)  $\angle 3$  and  $\angle 5$  and  $\angle 2$  and  $\angle 8$
- (iii)  $\angle 3$  and  $\angle 8$  and  $\angle 2$  and  $\angle 5$
- (iv)  $\angle 1$  and  $\angle 3$ ;  $\angle 2$  and  $\angle 4$ ;  $\angle 6$  and  $\angle 8$ ;  $\angle 5$  and  $\angle 7$

3. In the adjoining figure,  $p \parallel q$ . Find the unknown

Answer:

Given  $p \parallel q$  and it is intersected by a transversal.

$$\angle d = 125^\circ \quad (\text{Corresponding angle})$$

$$\text{Since, } 125^\circ + \angle e = 180^\circ \quad (\text{Linear pair})$$

$$\angle e = 180^\circ - 125^\circ$$

$$\angle e = 55^\circ$$

$$\angle e = \angle f = 55^\circ \quad (\text{Vertically opposite angles})$$

$$\angle e = \angle a = 55^\circ \quad (\text{Corresponding angles})$$

$$\angle a + \angle b = 180^\circ \quad (\text{Linear pair})$$

$$55^\circ + \angle b = 180^\circ$$

$$\angle b = 180^\circ - 55^\circ$$

$$\angle b = 125^\circ$$

$$\text{Also, } \angle b = \angle d = 125^\circ \quad (\text{Vertically opposite angles})$$

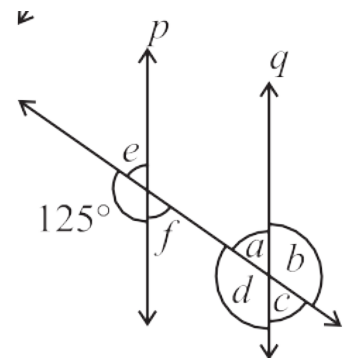
$$\angle a = \angle c = 55^\circ \quad (\text{Vertically opposite angles})$$

$$\text{Thus, } \angle a = 55^\circ$$

$$\angle b = 125^\circ$$

$$\angle c = 55^\circ$$

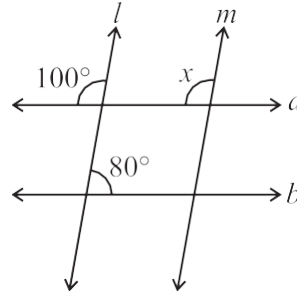
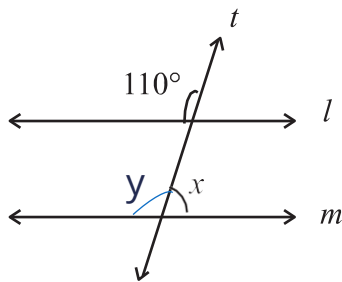
$$\angle d = 125^\circ;$$



$$\angle e = 55^\circ$$

$$\angle f = 55^\circ$$

4. Find the value of  $x$  in each of the following figures if  $l \parallel m$ .



Answer:

(i) Given  $l \parallel m$  and  $t$  is transversal,

$$\angle y = 110^\circ \quad (\text{Corresponding angle})$$

$$\angle x + \angle y = 180^\circ \quad (\text{Linear pair})$$

$$\angle x = 180^\circ - 110^\circ$$

$$\angle x = 70^\circ$$

(ii) Given  $l \parallel m$  and  $a \parallel b$ ,

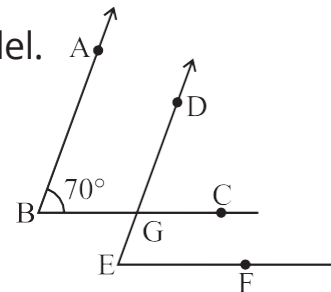
$$\angle x = 100^\circ \quad (\text{corresponding angle})$$

5. In the given figure, the arms of two angles are parallel.

If  $\angle ABC = 70^\circ$ , then find

(i)  $\angle DGC$

(ii)  $\angle DEF$



Answer:

(i) Given  $AB \parallel DG$  and  $BC$  is transversal

$$\text{Also, } \angle ABC = 70^\circ \quad (\text{Given})$$

Since,  $\angle ABC = \angle DGC$  (Corresponding angles)

Therefore,  $\angle DGC = 70^\circ$

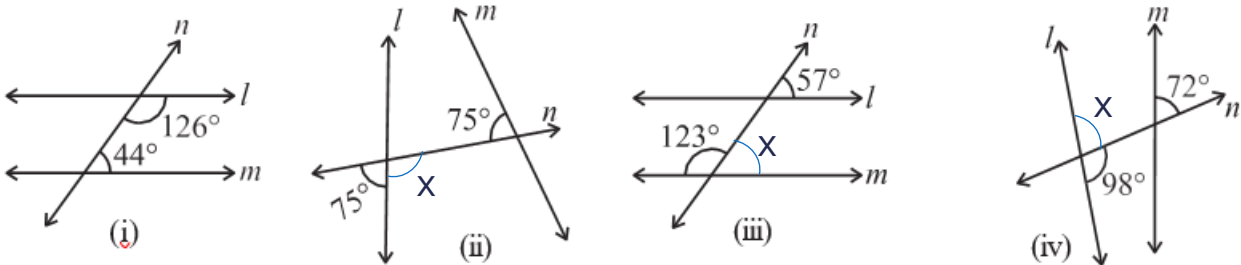
(ii) Given  $BC \parallel EF$  and  $DE$  is transversal

Also,  $\angle DGC = 70^\circ$  (from (i))

Since,  $\angle DGC = \angle DEF$  (Corresponding angles)

Therefore,  $\angle DEF = 70^\circ$

6. In the given figures below, decide whether  $l$  is parallel to  $m$ .



Answer:

(i)  $126^\circ + 44^\circ = 170^\circ$

As the sum of interior angles on the same side of transversal  $n$  is not  $180^\circ$ . Therefore,  $l$  is not parallel to  $m$ .

(ii)  $\angle x + 75^\circ = 180^\circ$  (Linear pair)

$\angle x = 180^\circ - 75^\circ$

$\angle x = 105^\circ$

The measure of  $\angle x$  is  $105^\circ$  and its corresponding angle is  $75^\circ$ .

Therefore, the lines  $l$  and  $m$  are not parallel

(iii)  $\angle y = 57^\circ$  (Vertically opposite angles)

$\angle x + 123^\circ = 180^\circ$  (Linear pair)

$\angle x = 180^\circ - 123^\circ$

$\angle x = 57^\circ$



Here, the measures of corresponding angles are equal *i.e.*,  $57^\circ$ .

Therefore, lines  $l$  and  $m$  are parallel to each other.

(iv)  $\angle x + 98^\circ = 180^\circ$  (Linear pair)

$$\angle x = 180^\circ - 98^\circ$$

$$\angle x = 82^\circ$$

The measures of corresponding angles are  $82^\circ$  and  $72^\circ$  which are not equal.

Therefore,  $l$  and  $m$  are not parallel to each other.

