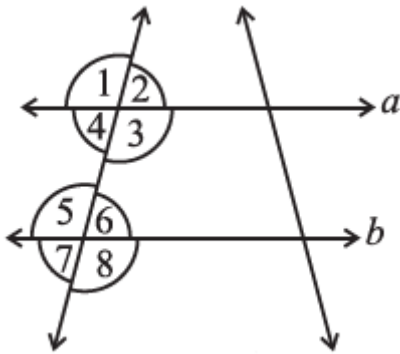


EXERCISE 5.2

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



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

Solution:-

Corresponding angles property is used in the above statement.

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

Solution:-

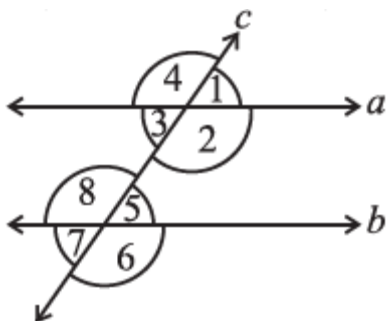
Alternate interior angles property is used in the above statement.

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

Solution:-

Interior angles on the same side of the transversal are supplementary.

2. In the adjoining figure, identify



(i) The pairs of corresponding angles.

Solution:-

By observing the figure, the pairs of the corresponding angles are,

$\angle 1$ and $\angle 5$, $\angle 4$ and $\angle 8$, $\angle 2$ and $\angle 6$, $\angle 3$ and $\angle 7$

(ii) The pairs of alternate interior angles.

Solution:-

By observing the figure, the pairs of alternate interior angles are,

$\angle 2$ and $\angle 8$, $\angle 3$ and $\angle 5$

(iii) The pairs of interior angles on the same side of the transversal.

Solution:-

By observing the figure, the pairs of interior angles on the same side of the transversal are $\angle 2$ and $\angle 5$, $\angle 3$ and $\angle 8$

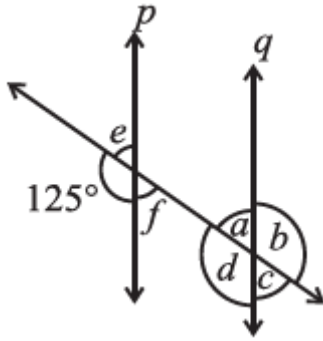
(iv) The vertically opposite angles.

Solution:-

By observing the figure, the vertically opposite angles are,

$\angle 1$ and $\angle 3$, $\angle 5$ and $\angle 7$, $\angle 2$ and $\angle 4$, $\angle 6$ and $\angle 8$

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



Solution:-

By observing the figure,

$$\angle d = \angle 125^\circ \dots [\because \text{corresponding angles}]$$

We know that Linear pair is the sum of adjacent angles is 180°

Then,

$$= \angle e + 125^\circ = 180^\circ \dots [\text{Linear pair}]$$

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

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

From the rule of vertically opposite angles,

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

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

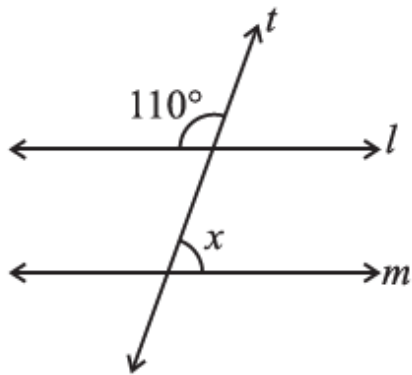
By the property of corresponding angles,

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

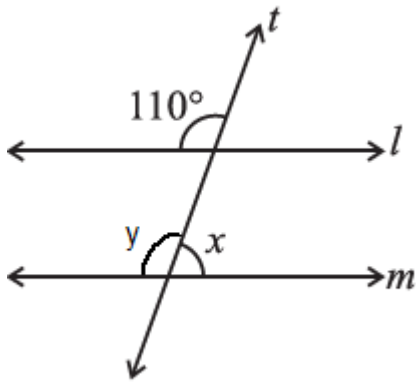
$$\angle a = \angle e = 55^\circ$$

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

(i)

**Solution:-**

Let us assume the other angle on the line m be $\angle y$.



Then,

By the property of corresponding angles,

$$\angle y = 110^\circ$$

We know that Linear pair is the sum of adjacent angles is 180°

Then,

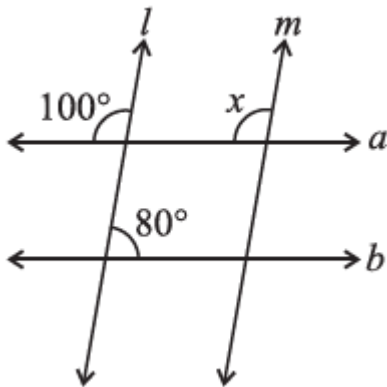
$$= \angle x + \angle y = 180^\circ$$

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

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

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

(ii)

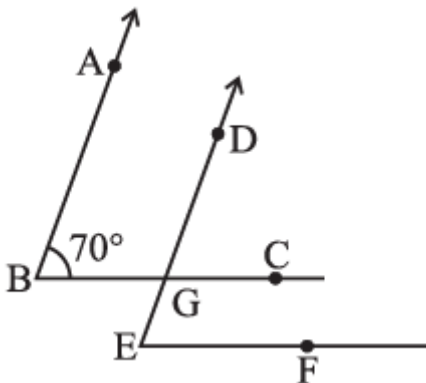


Solution:-

By the property of corresponding angles,

$$\angle x = 100^\circ$$

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



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

(i) $\angle DGC$

(ii) $\angle DEF$

Solution:-

(i) Let us consider $AB \parallel DG$.

BC is the transversal line intersecting AB and DG .

By the property of corresponding angles

$$\angle DGC = \angle ABC$$

Then,

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

(ii) Let us consider that $BC \parallel EF$.

DE is the transversal line intersecting BC and EF.

By the property of corresponding angles

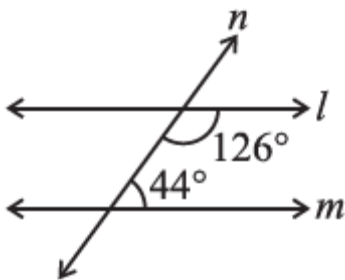
$$\angle DEF = \angle DGC$$

Then,

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

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

(i)



Solution:-

Let us consider the two lines, l and m .

n is the transversal line intersecting l and m .

We know that the sum of interior angles on the same side of the transversal is 180° .

Then,

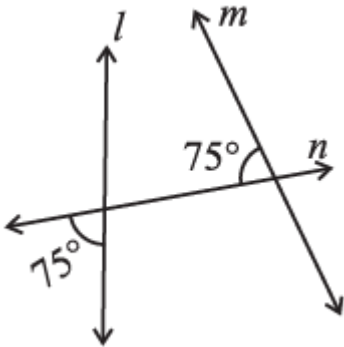
$$= 126^\circ + 44^\circ$$

$$= 170^\circ$$

But, the sum of interior angles on the same side of transversal is not equal to 180° .

So, line l is not parallel to line m .

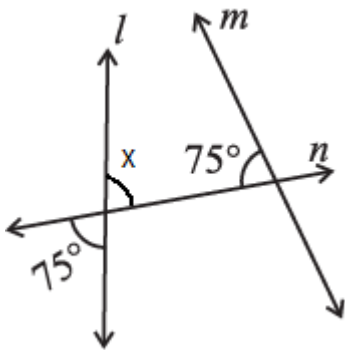
(ii)



Solution:-

Let us assume $\angle x$ be the vertically opposite angle formed due to the intersection of the straight line l and transversal n ,

Then, $\angle x = 75^\circ$



Let us consider the two lines, l and m .

n is the transversal line intersecting l and m .

We know that the sum of interior angles on the same side of the transversal is 180° .

Then,

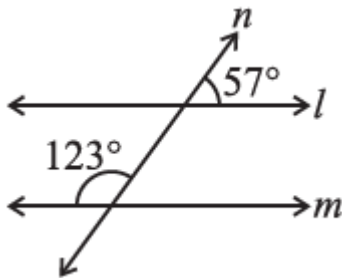
$$= 75^\circ + 75^\circ$$

$$= 150^\circ$$

But, the sum of interior angles on the same side of transversal is not equal to 180° .

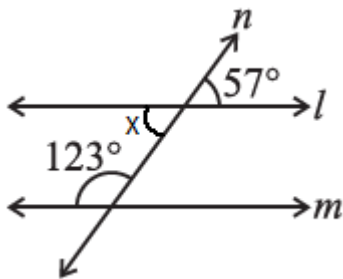
So, line l is not parallel to line m .

(iii)



Solution:-

Let us assume $\angle x$ be the vertically opposite angle formed due to the intersection of the straight line l and transversal line n .



Let us consider the two lines, l and m .

n is the transversal line intersecting l and m .

We know that the sum of interior angles on the same side of the transversal is 180° .

Then,

$$= 123^\circ + \angle x$$

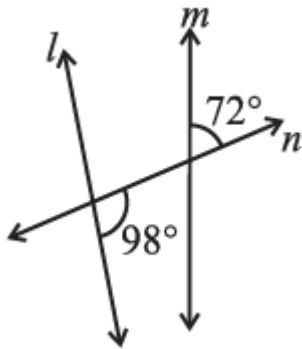
$$= 123^\circ + 57^\circ$$

$$= 180^\circ$$

\therefore The sum of interior angles on the same side of the transversal is equal to 180° .

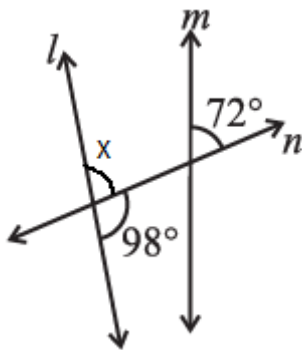
So, line l is parallel to line m .

(iv)



Solution:-

Let us assume $\angle x$ be the angle formed due to the intersection of the Straight line l and transversal line n .



We know that the Linear pair is the sum of adjacent angles equal to 180° .

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

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

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

Now, we consider $\angle x$ and 72° are the corresponding angles.

For l and m to be parallel to each other, corresponding angles should be equal.

But, in the given figure, corresponding angles measure 82° and 72° , respectively.

\therefore Line l is not parallel to line m .