1. State the property that is used in each of the following statements?
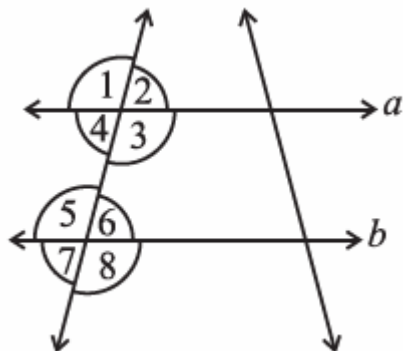
(i) If a ‖ b, then ∠1 = ∠5.

Solution:-

Corresponding angles property is used in the above statement.

(ii) If ∠4 = ∠6, then a ‖ b.

Solution:-

Alternate interior angles property is used in the above statement.

(iii) If ∠4 + ∠5 = 180°, then a ‖ b.

Solution:-

Interior angles on the same side of transversal are supplementary.

2. In the adjoining figure, identify
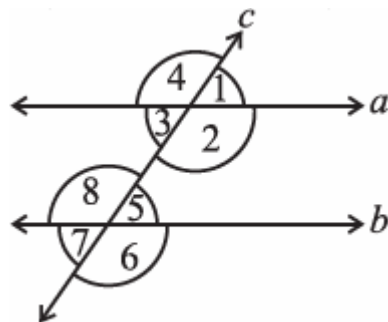
(i) The pairs of corresponding angles.

Solution:-

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

∠1 and ∠5, ∠4 and ∠8, ∠2 and ∠6, ∠3 and ∠7

(ii) The pairs of alternate interior angles.

Solution:-

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

∠2 and ∠8, ∠3 and ∠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

∠2 and ∠5, ∠3 and ∠8

(iv) The vertically opposite angles.

Solution:-

By observing the figure, the vertically opposite angles are,

∠1 and ∠3, ∠5 and ∠7, ∠2 and ∠4, ∠6 and ∠8

3. In the adjoining figure, p ∥ q. Find the unknown angles.
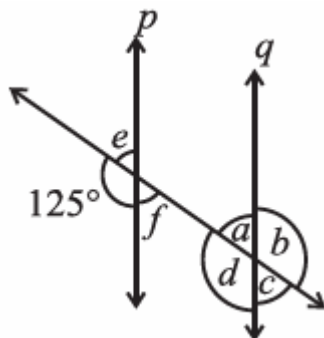
Solution:-

By observing the figure,

∠d = ∠125° … [∵ corresponding angles]

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

= ∠e + 125° = 180° … [Linear pair]

= ∠e = 180° − 125°

= ∠e = 55°

From the rule of vertically opposite angles,

∠f = ∠e = 55°

∠b = ∠d = 125°

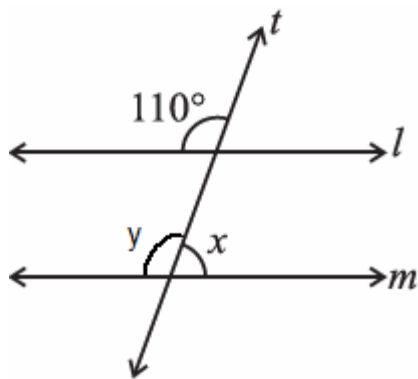By the property of corresponding angles,

∠c = ∠f = 55°

∠a = ∠e = 55°

4. Find the value of x in each of the following figures if l ∥ m.

(i)
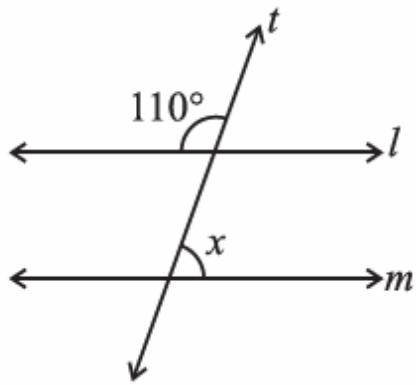
Solution:-

Let us assume other angle on the line m be ∠y,

Then,
By the property of corresponding angles,

∠y = 110°

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

= ∠x + ∠y = 180°
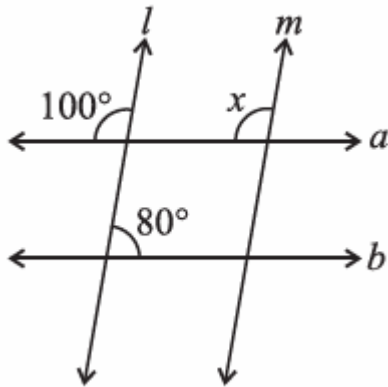
= ∠x + 110° = 180°

= ∠x = 180° − 110°

= ∠x = 70°

(ii)

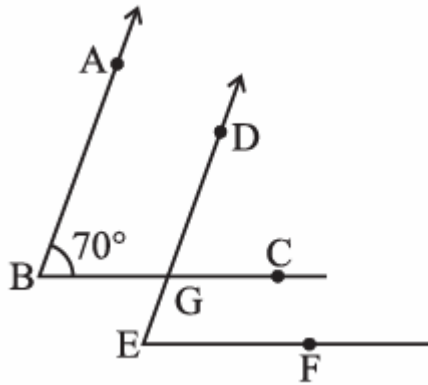**Solution:-**

By the property of corresponding angles,

∠x = 100°

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

If ∠ABC = 70°, then find

(i) ∠DGC

(ii) ∠DEF

Solution:-

(i) Let us consider that AB ∥ DG

BC is the transversal line intersecting AB and DG
By the property of corresponding angles,

∠DGC = ∠ABC

Then,

∠DGC = 70°

(ii) Let us consider that BC ∥ EF

DE is the transversal line intersecting BC and EF
By the property of corresponding angles,

∠DEF = ∠DGC

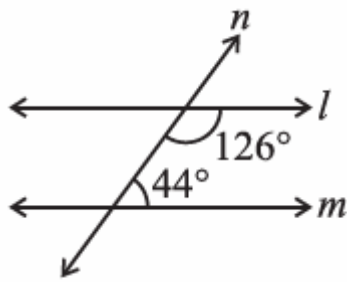Then,

∠DEF = 70°

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.

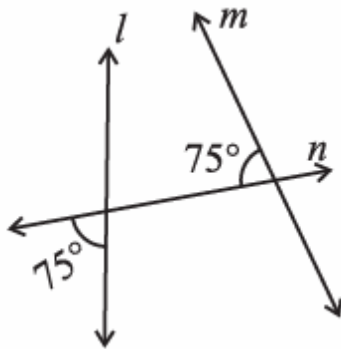We know that the sum of interior angles on the same side of transversal is 180°.

Then,

= 126° + 44°

= 170°

But, the sum of interior angles on the same side of transversal is not equal to 180°.
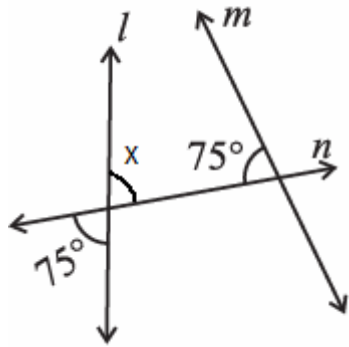
So, line l is not parallel to line m.

(ii)

Solution:-

Let us assume ∠x be the vertically opposite angle formed due to the intersection of the

straight line l and transversal n,

Then, ∠x = 75°

Let us consider the two lines I and m,

n is the transversal line intersecting I and m.

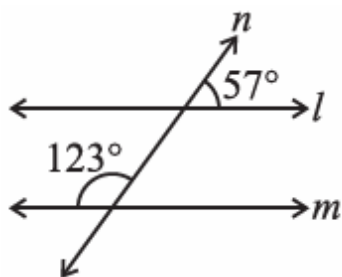We know that the sum of interior angles on the same side of transversal is 180º.

Then,

= 75º + 75º

= 150º

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

So, line I is not parallel to line m.
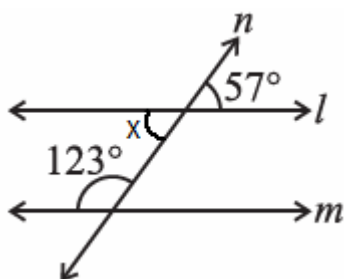
(iii)

Solution:-

Let us assume ∠x be the vertically opposite angle formed due to the intersection of the

Straight line I and transversal line n,

Let us consider the two lines I and m,

n is the transversal line intersecting I and m.

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

Then,

= 123° + ∠x

= 123° + 57°
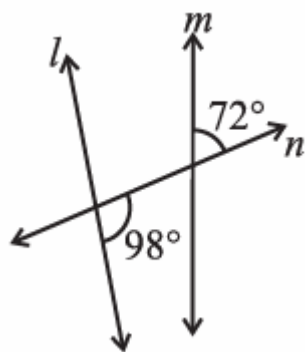= 180°

∴The sum of interior angles on the same side of transversal is equal to 180°.
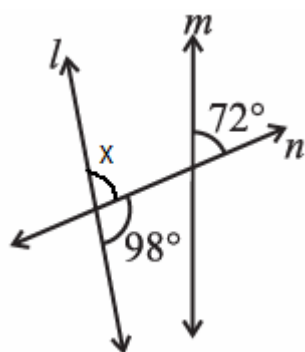
So, line l is parallel to line m.
(iv)

Solution:-

Let us assume ∠x be the angle formed due to the intersection of the Straight line l and

transversal line n,

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

= ∠x + 98° = 180°

= ∠x = 180° − 98°

= ∠x = 82°

Now, we consider ∠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 measures 82° and 72° respectively.

∴Line l is not parallel to line m.