Lines and Angles Ex 8.4 Q26

Answer :

(i)

Statement: If two lines are intersected by a transversal, then corresponding angles are equal.

False

Reason:

The above statement holds good if the lines are parallel only.

(ii)

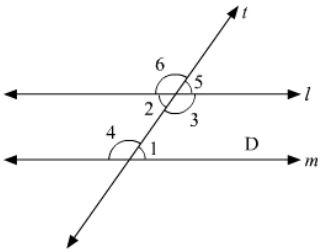
Statement: If two parallel lines are intersected by a transversal, then alternate interior angles are equal.

True

Reason:

Let *l* and *m* are two parallel lines.

And transversal *t* intersects *l* and *m* making two pair of alternate interior angles, $\angle 1, \angle 2$ and $\angle 3, \angle 4$.



We need to prove that $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$.

We have,

$\angle 2 = \angle 5$ (Vertically opposite angles)

And, $\angle 1 = \angle 5$ (corresponding angles)

Therefore,

$\angle 1 = \angle 2$ (Vertically opposite angles)

Again, $\angle 3 = \angle 6$ (corresponding angles)

Hence, $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$.

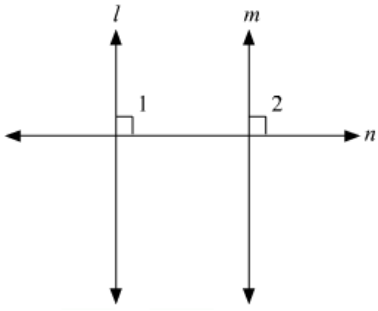
(iii)

Statement: Two lines perpendicular to the same line are perpendicular to each other.

False

Reason:

The figure can be drawn as follows:



Here, $l \perp n$ and $m \perp n$

It is given that $l \perp n$, therefore,

$\angle 1 = 90^0$ (i)

Similarly, we have $m \perp n$, therefore,

$\angle 2 = 90^0$ (ii)

From (i) and (ii), we get:

$\angle 1 = \angle 2$

But these are the pair of corresponding angles.

Theorem states: If a transversal intersects two lines in such a way that a pair of corresponding angles is equal, then the two lines are parallel.

Thus, we can say that $l \| m$.

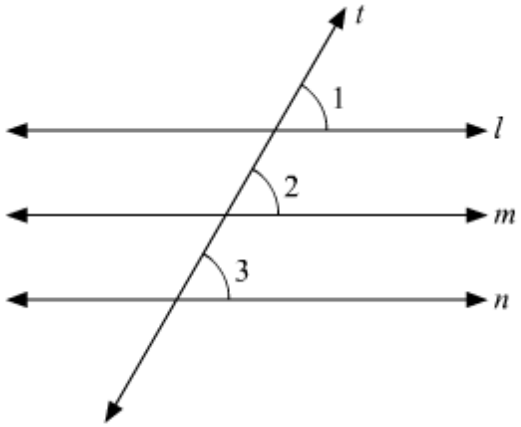
(iv)

Statement: Two lines parallel to the same line are parallel to each other.

True

Reason:

The figure is given as follows:



It is given that $l \| m$ and $m \| n$

We need to show that $l \| m$

We have $l \| m$, thus, corresponding angles should be equal.

That is,

$\angle 1 = \angle 2$

Similarly,

$\angle 3 = \angle 2$

Therefore,

$\angle 1 = \angle 3$

But these are the pair of corresponding angles.

Therefore, $l \| m$.

(v)

Statement: If two parallel lines are intersected by a transversal, then interior angles on the same side of the transversal are equal.

False

Reason:

Theorem states: If a transversal intersects two parallel lines then the pair of alternate interior angles is equal.

Lines and Angles Ex 8.4 Q27

Answer :

(i) If two parallel lines are intersected by a transversal, then corresponding angles are equal.

(ii) If two parallel lines are intersected by a transversal, then interior angles on the same side of the transversal are supplementary.

(iii) Two lines perpendicular to the same line are parallel to each other.

(iv) Two lines parallel to the same line are parallel to each other.

(v) If a transversal intersects a pair of lines in such a way that a pair of interior angles is equal, then the lines are parallel.

(vi) If a transversal intersects a pair of lines in such a way that a pair of interior angles on the same side of transversal is 180^0, then the lines are parallel.

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