



Properties of Triangles Ex 15.2 Q19

Answer :

- (i) No, because if there are two right angles in a triangle, then the third angle of the triangle must be zero, which is not possible.
- (ii) No, because as we know that the sum of all three angles of a triangle is always 180° . If there are two obtuse angles, then their sum will be more than 180° , which is not possible in case of a triangle.
- (iii) Yes, in right triangles and acute triangles, it is possible to have two acute angles.
- (iv) No, because if each angle is less than 60° , then the sum of all three angles will be less than 180° , which is not possible in case of a triangle.

Proof :

Let the three angles of the triangle be $\angle A$, $\angle B$ and $\angle C$.

As per the given information,

$$\angle A < 60^\circ \dots (i)$$

$$\angle B < 60^\circ \dots (ii)$$

$$\angle C < 60^\circ \dots (iii)$$

On adding (i), (ii) and (iii), we get :

$$\angle A + \angle B + \angle C < 60^\circ + 60^\circ + 60^\circ$$

$$\angle A + \angle B + \angle C < 180^\circ$$

We can see that the sum of all three angles is less than 180° , which is not possible for a triangle.

Hence, we can say that it is not possible for each angle of a triangle to be less than 60° .

- (v) No, because if each angle is greater than 60° , then the sum of all three angles will be greater than 180° , which is not possible.

Proof :

Let the three angles of the given triangle be $\angle A$, $\angle B$ and $\angle C$.

As per the given information,

$$\angle A > 60^\circ \dots (i)$$

$$\angle B > 60^\circ \dots (ii)$$

$$\angle C > 60^\circ \dots (iii)$$

On adding (i), (ii) and (iii), we get :

$$\angle A + \angle B + \angle C > 60^\circ + 60^\circ + 60^\circ$$

$$\angle A + \angle B + \angle C > 180^\circ$$

We can see that the sum of all three angles of the given triangle are greater than 180° , which is not possible for a triangle.

Hence, we can say that it is not possible for each angle of a triangle to be greater than 60° .

- (vi) Yes, if each angle of the triangle is equal to 60° , then the sum of all three angles will be 180° , which is possible in case of a triangle.

Proof :

Let the three angles of the given triangle be $\angle A$, $\angle B$ and $\angle C$.

As per the given information,

$$\angle A = 60^\circ \dots (i)$$

$$\angle B = 60^\circ \dots (ii)$$

$$\angle C = 60^\circ \dots (iii)$$

On adding (i), (ii) and (iii), we get :

$$\angle A + \angle B + \angle C = 60^\circ + 60^\circ + 60^\circ$$

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

We can see that the sum of all three angles of the given triangle is equal to 180° , which is possible in case of a triangle.

Hence, we can say that it is possible for each angle of a triangle to be equal to 60° .

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