



#### Exercise 15C

Q4

**Answer :**

Sum of any two sides of a triangle is greater than the third side.

In  $\triangle AMB$ :

$$AB + BM > AM \dots\dots (i)$$

In  $\triangle AMC$ :

$$AC + CM > AM \dots\dots (ii)$$

Adding the above two equation:

$$AB + BM + AC + CM > AM + AM$$

$$AB + BC + AC > 2AM$$

Hence, proved.

Q5

**Answer :**

Sum of any two sides of a triangle is greater than the third side.

*In  $\triangle APB$ :*

$$AB + BP > AP$$

*In  $\triangle APC$ :*

$$AC + PC > AP$$

*Adding the correspondong sides :*

$$AB + BP + AC + PC > AP + AP$$

$$AB + AC + BC > 2AP$$

Hence, proved.

Q6

**Answer :**

Sum of any two sides of a triangle is greater than the third side.

In  $\triangle ABC$ :

$$AB + BC > AC$$

In  $\triangle ADC$ :

$$CD + DA > AC$$

Adding the above two:

$$AB + BC + CD + DA > 2 AC \quad \dots (i)$$

In  $\triangle ADB$ :

$$AD + AB > BD$$

In  $\triangle BDC$ :

$$CD + BC > BD$$

Adding the above two:

$$AB + BC + CD + DA > 2 BD \quad \dots (ii)$$

Adding equation (i) and (ii):

$$\begin{aligned} AB + BC + CD + DA + AB + BC + CD + DA &> 2(AC + BD) \\ \Rightarrow 2(AB + BC + CD + DA) &> 2(AC + BD) \\ \Rightarrow AB + BC + CD + DA &> AC + BD \end{aligned}$$

Q7

**Answer :**

We know that the sum of any two sides of a triangle is greater than the third side.

In  $\triangle AOB$ :

$$OA + OB > AB \dots (1)$$

In  $\triangle BOC$ :

$$OB + OC > BC \dots (2)$$

In  $\triangle AOC$ :

$$OA + OC > CA \dots (3)$$

Adding (1), (2) and (3):

$$OA + OB + OB + OC + OA + OC > AB + BC + CA$$

$$2(OA + OB + OC) > AB + BC + CA$$

Hence, proved.

\*\*\*\*\* END \*\*\*\*\*