Properties of Triangles Ex 15.4 Q1

Answer :

(i) Yes, these numbers can be the lengths of the sides of a triangle because the sum of any two sides of a triangle is always greater than the third side.
Here,
$5+7>9,\ \ 5+9>7,\ \ 9+7>5$

(ii) No, these numbers cannot be the lengths of the sides of a triangle because the sum of any two sides of a triangle is always greater than the third side, which is not true in this case.

(iii) Yes, these numbers can be the lengths of the sides of a triangle because the sum of any two sides of triangle is always greater than the third side.
Here,
$3+4\ >5,\ \ 3+5>4,\ \ 4+5>3$

(iv) No, these numbers cannot be the lengths of the sides of a triangle because the sum of any two sides of a triangle is always greater than the third side, which is not true in this case.
Here,
$2+5\ =\ 7$

(v) No, these numbers cannot be the lengths of the sides of a triangle because the sum of any two sides of a triangle is always greater than the third side, which is not true in this case.
Here,
$5+8\ <20$

Properties of Triangles Ex 15.4 Q2

Answer :

(i) In triangle APB, AP < AB + BP because the sum of any two sides of a triangle is greater than the third side.

(ii) In triangle APC, AP < AC + PC because the sum of any two sides of a triangle is greater than the third side.

(iii) AP < $\frac{1}{2}\left(\mathrm{AB}+\mathrm{AC}+\mathrm{BC}\right)$
In triangles ABP and ACP, we can see that:
AP < AB + BP ...(i) (Because the sum of any two sides of a triangle is greater than the third side)
AP < AC + PC ...(ii) (Because the sum of any two sides of a triangle is greater than the third side)

On adding (i) and (ii), we have:

AP + AP < AB + BP + AC + PC
2AP < AB + AC + BC (BC = BP + PC)
AP < $\frac{1}{2}\left(\mathrm{AB}+\mathrm{AC}+\mathrm{BC}\right)$

*********** END **********