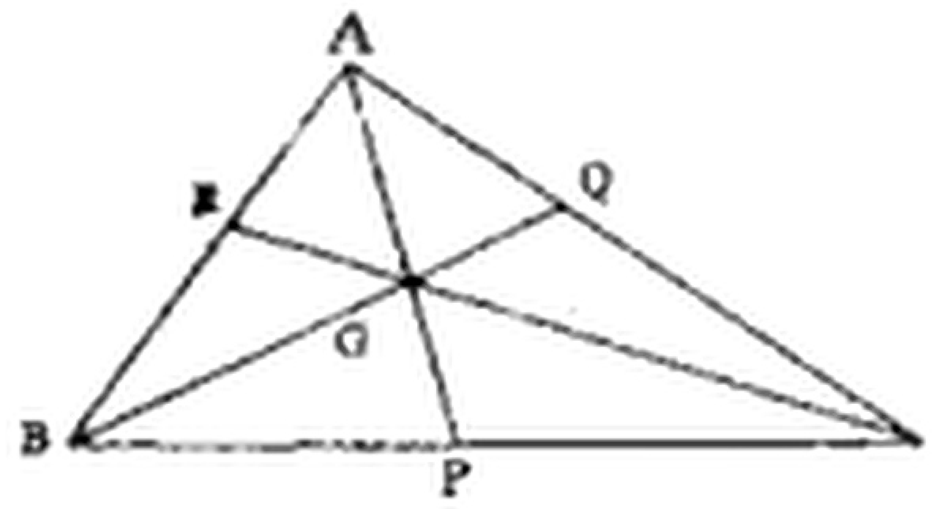
EXERCISE 11.4

Q1. The distance of the point of concurrency of the medians of a triangle from its vertices are respectively 1.2 cm, 1.4 cm and 1.6 cm. Find the lengths of its medians.

Solution:



Let ABC be triangle with the point of concurrency of medians at G.

m$\overline{AG}$ = 1.2 cm, m $\overline{BG}$ = 1.4 cm and m$\overline{CG}$ = 1.6 cm

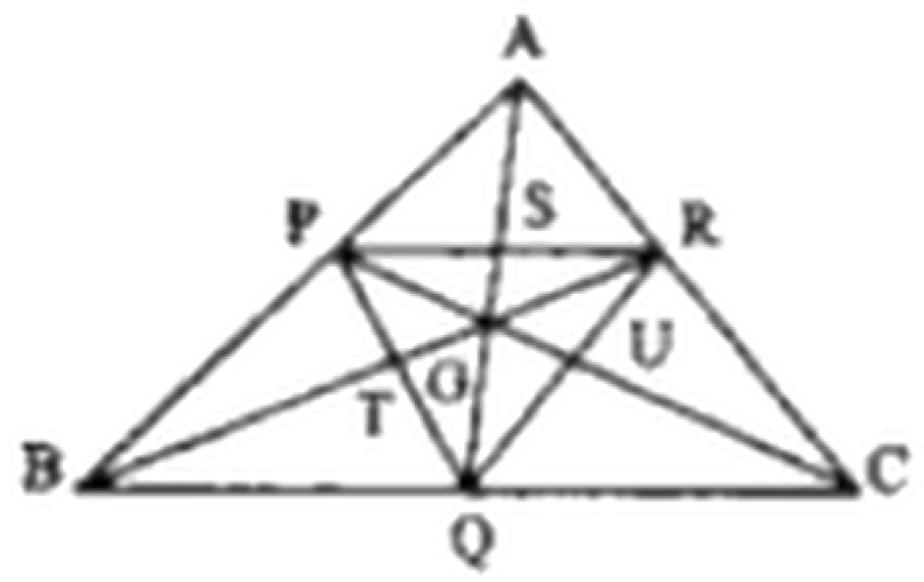
m$\overline{AP}$ = $\frac{3}{2}$(m$\overline{AG}$) = $\frac{3}{2}$ × 1.2 = 1.8 cm

m$\overline{BQ}$ = $\frac{3}{2}$((m$\overline{BG}$) = $\frac{3}{2}$ ×1.4 = 2.1 cm

m$\overline{CR}$ = $\frac{3}{2}$((m$\overline{CG}$) = $\frac{3}{2}$ ×1.6 = 2.4 cm

Q2. Prove that the point of concurrency of the medians of a triangle and the triangle which is made by joining the mid-points of its sides is the same.

Solution:



Given:

In triangle ABC, $\overline{CP}$, $\overline{AQ}$, $\overline{BR}$ are medians, with meet at G. ΔPQR is formed by joining the mid points P, Q, R.

To prove:

G is the point of concurrency of the medians of ΔABC and ΔPQR.

Proof

Statements	Reasons
$\overline{PR} \parallel \overline{BC}$	P, R, are mid-points of $\overline{AB}$, $\overline{AC}$.
$\overline{PR} \parallel \overline{BQ}$	
Similarly, $\overline{QR} \parallel \overline{BP}$	
∴ PBQR is a parallelogram.	
Its diagonal $\overline{BR}$ and $\overline{PQ}$	
I bisect each other at T.	
i.e. T is mid-point of $\overline{PQ}$.	
Similarly, U is midpoint of $\overline{QR}$ and S is mid-point of $\overline{PR}$.	
∴ $\overline{PU}$, $\overline{QS}$, $\overline{RT}$ are medians of ΔPQR	
(i) $\overline{AQ}$ and $\overline{SQ}$ pass through G.	
(ii) $\overline{BR}$ and $\overline{TR}$ pass through G.	
(iii)$\overline{CP}$ and $\overline{UP}$ pass through G.	
Hence G is point of concurrency of medians of ΔAGC and ΔPQR.	