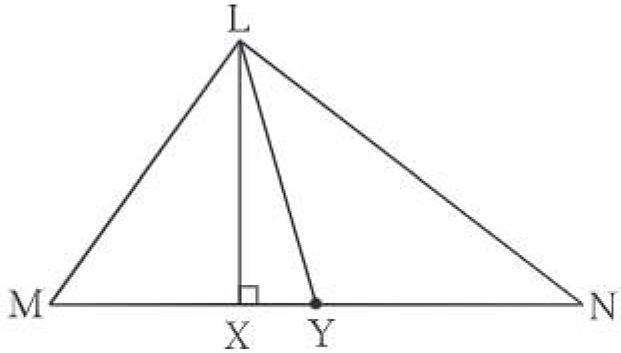
PRACTICE SET 4.1 PAGE NO: 22

1. In ΔLMN, ... is an altitude and ...... is a median. (Write the names of appropriate segments.)



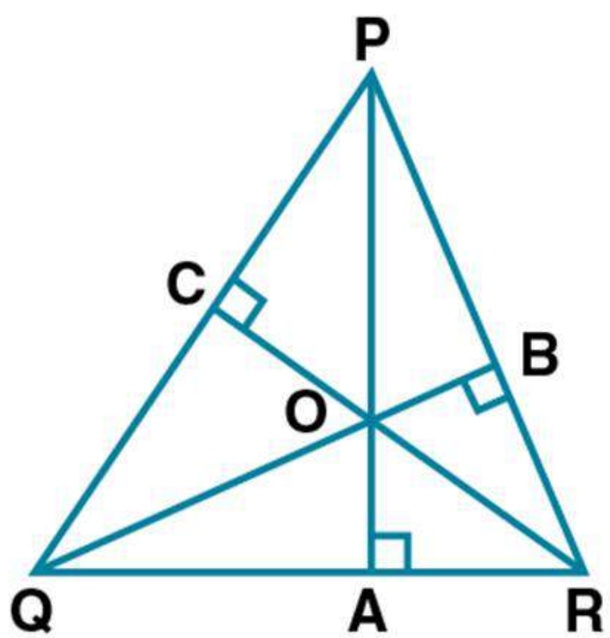
Solution:

In ΔLMN, LX is the altitude (since it makes a 90° angle) and LY is a median (since it divides the base into two equal halves i.e., MY = NY).

2. Draw an acute-angled ΔPQR. Draw all of its altitudes. Name the point of concurrence as 'O'.

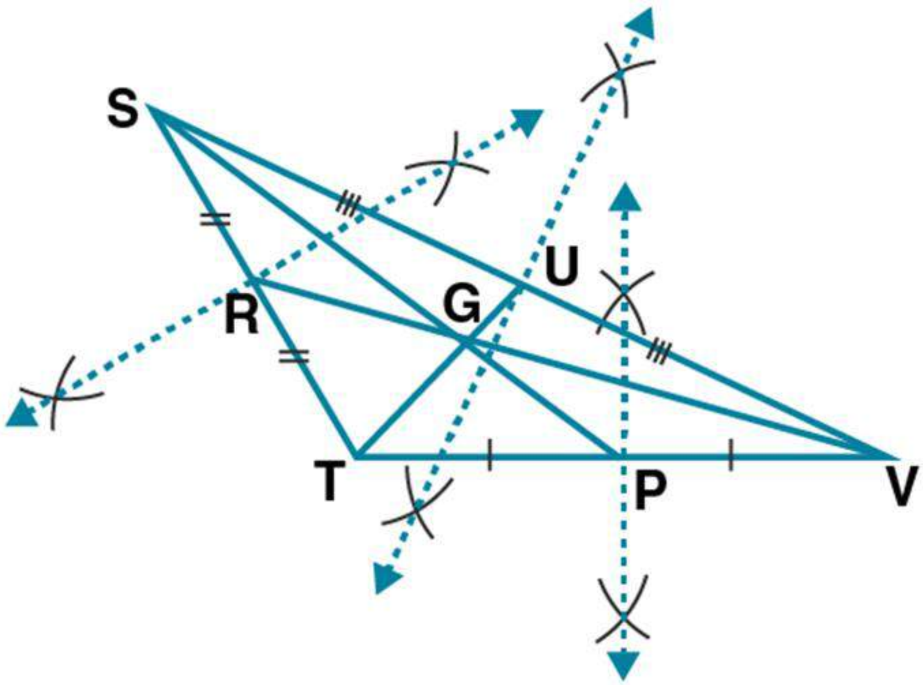
Solution:

Here, is the acute-angled ΔPQR



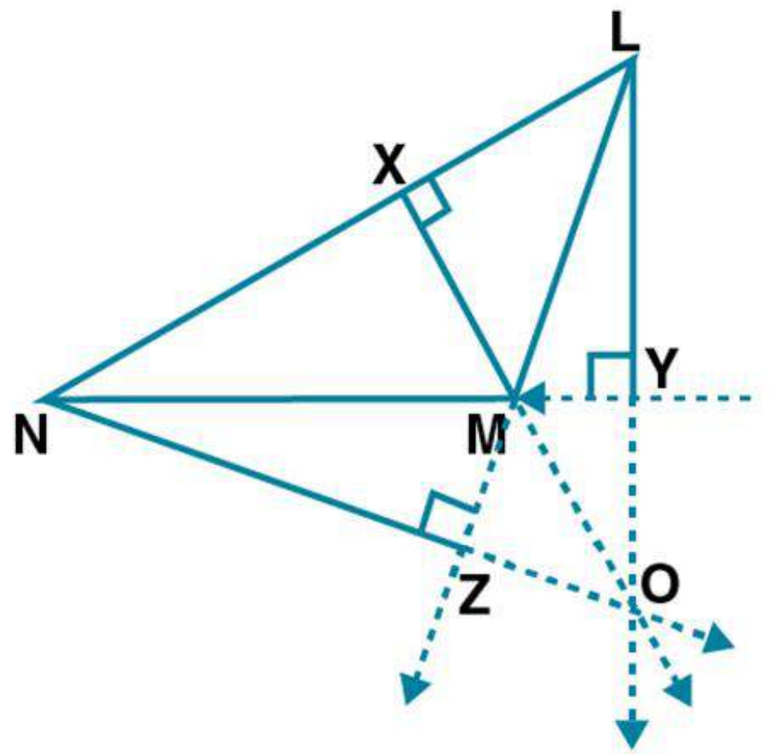
Seg PA, seg BQ, seg CR are the altitudes of ΔPQR. The point of concurrence is denoted by the point O.

3. Draw an obtuse-angled ∆STV. Draw its medians and show the centroid.
Solution:
Here, is the obtuse-angled ∆STV.



Seg SP, seg UT and seg RV are medians of ∆STV.
Their point of concurrence is denoted by G.

4. Draw an obtuse-angled ∆LMN. Draw its altitudes and denote the orthocenter by ‘O’.
Solution:
Here, is the obtuse-angled ∆LMN.

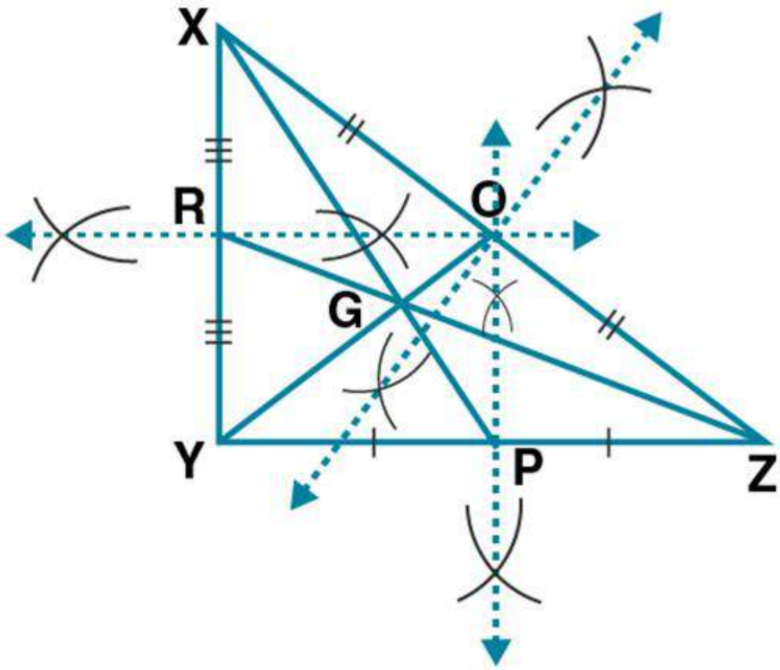


The orthocenter of the obtuse triangle lies outside the triangle.
The point O denotes the orthocenter of the obtuse-angled ΔLMN.

5. Draw a right angled ΔXYZ. Draw its medians and show their point of concurrence by G.

Solution:

Here, is the right angled ΔXYZ.

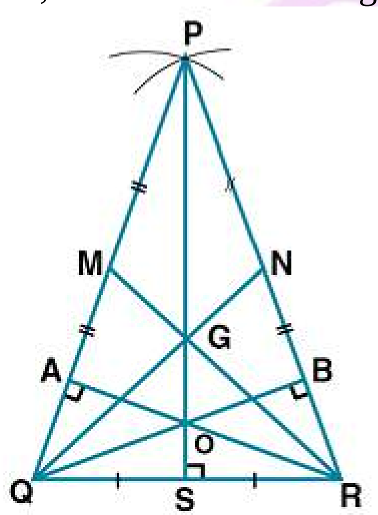


Their point of concurrence is denoted by G.

6. Draw an isosceles triangle. Draw all of its medians and altitudes. Write your observation about their points of concurrence.

Solution:

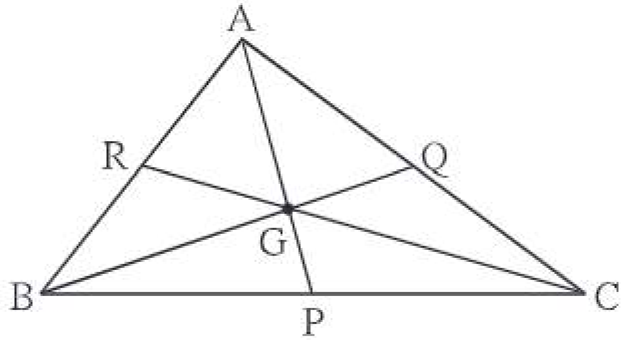
Here, is the isosceles triangle.



About the points of concurrence:

The medians i.e. G and altitudes i.e. O lie on the same line on PS which is the perpendicular bisector of seg QR.

7. Fill in the blanks.



Point G is the centroid of ΔABC.
(1) If l(RG) = 2.5 then l(GC) = ...
(2) If l(BG) = 6 then l(BQ) = ...
(3) If l(AP) = 6 then l(AG) = ... and l(GP) = ...
Solution:
(1) If l(RG) = 2.5 then l(GC) = 5.
We know that the centroid divides each median in the ratio 2:1.
So, CG/RG = 2/1
CG/2.5 = 2/1
CG = 2 × 2.5
= 5

(2) If l(BG) = 6 then l(BQ) = 9.
We know that the centroid divides each median in the ratio 2:1.
So, BG/QG = 2/1
6/QG = 2/1
6 × 1 = 2 × QG
6 = 2 × QG
6/2 = QG
QG = 3.

Since we have to find I(BQ), and from the figure it can be seen that,
(BQ) = I(BG) + I(QG)
So, I(BQ) = 6 + 3
I(BQ) = 9.

(3) If l(AP) = 6 then l(AG) = 4 and l(GP) = 2.
We know that the centroid divides each median in the ratio 2:1.
Here both I(AG) and I(GP) are unknown so,
Let I(AG), I(GP) be 2x and x respectively, from equation (i)

I(AP) = I(AG) + I(GP)
6 = 2x + x
6 = 3x
6/3 = x
x = 2.

I(AG) = 2x = 2×2 = 4.
I(GP) = x = 2.