

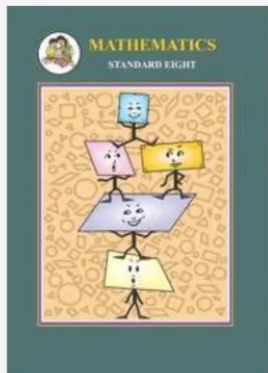
Maharashtra Board Solutions Class 8-Maths

(Practice Set 4.1): Chapter 4- Altitudes and Medians of a Triangle

BOOK SOLUTIONS
CLASS 8
MATHS

CHAPTER 4
Altitudes and Medians of a Triangle

Maharashtra Board Solutions→



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Maharashtra Board Solutions Class 8-Maths

(Practice Set 4.1): Chapter 4- Altitudes and Medians of a Triangle

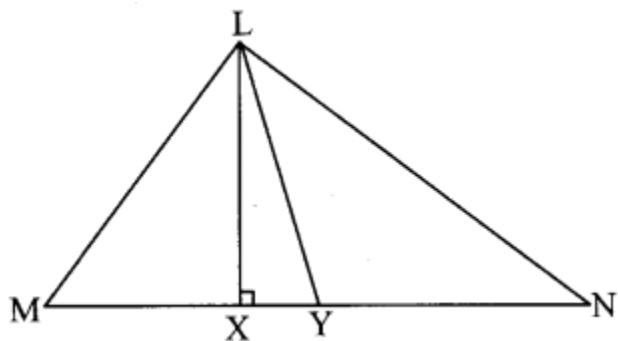
Class 8: Maths Chapter 4 solutions. Complete Class 8 Maths Chapter 4 Notes.

Maharashtra Board Solutions Class 8-Maths (Practice Set 4.1): Chapter 4- Altitudes and Medians of a Triangle

Maharashtra Board 8th Maths Chapter 4, Class 8 Maths Chapter 4 solutions

Question 1.

In $\triangle LMN$, ___ is an altitude and ___ is a median, (write the names of appropriate segments.)



Solution:

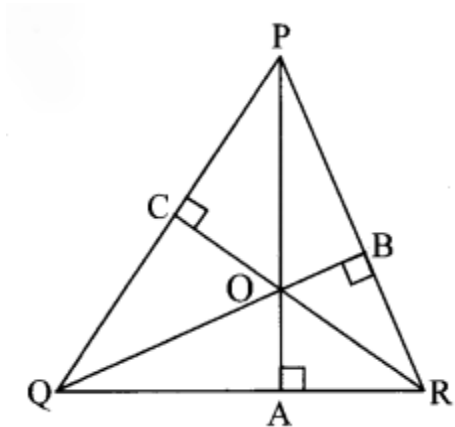
In $\triangle LMN$, seg LX is an altitude and seg LY is a median.

Question 2.

Draw an acute angled $\triangle PQR$. Draw all of its altitudes. Name the point of concurrence as 'O'.

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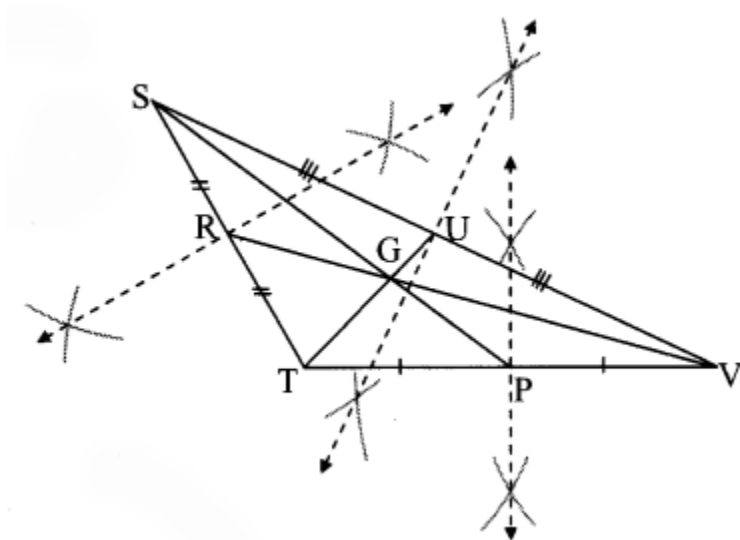
Solution:



Question 3.

Draw an obtuse angled $\triangle STV$. Draw its medians and show the centroid.

Solution:

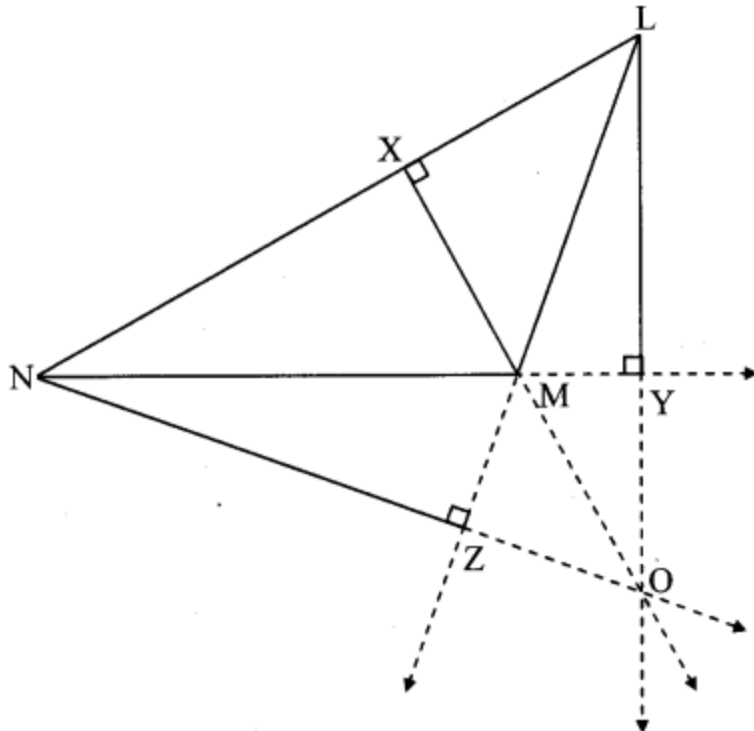


Question 4.

Draw an obtuse angled $\triangle LMN$. Draw its altitudes and denote the ortho centre by 'O'.

Solution:

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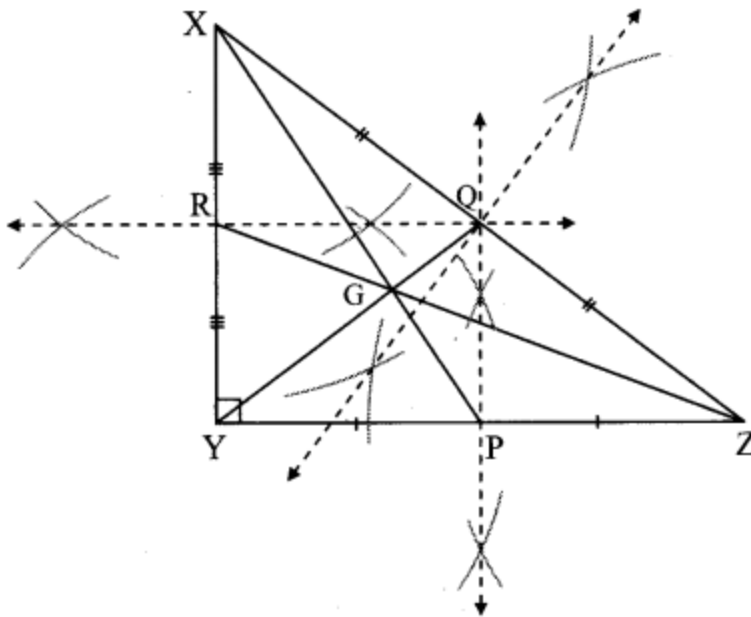


Question 5.

Draw a right angled $\triangle XYZ$. Draw its medians and show their point of concurrence by G.

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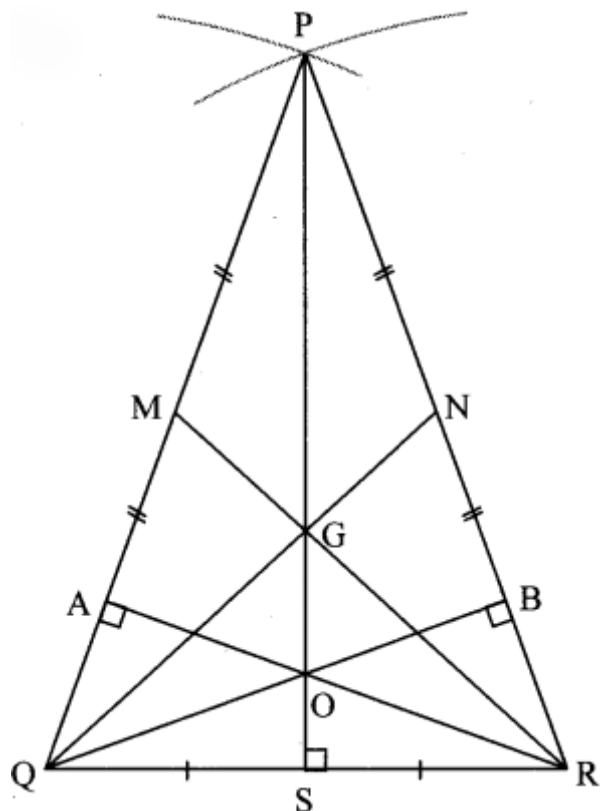


Question 6.

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

Solution:

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

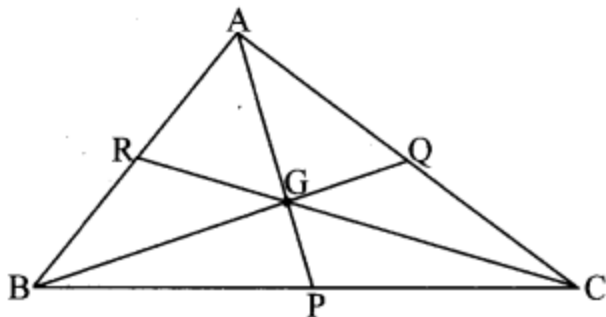
Question 7.

Fill in the blanks.

Point G is the centroid of $\triangle ABC$.

- i. If $l(RG) = 2.5$, then $l(GC) = \underline{\hspace{2cm}}$
- ii. If $l(BG) = 6$, then $l(BQ) = \underline{\hspace{2cm}}$
- iii. If $l(AP) = 6$, then $l(AG) = \underline{\hspace{2cm}}$ and $l(GP) = \underline{\hspace{2cm}}$.

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Solution:

The centroid of a triangle divides each median in the ratio 2:1.

i. Point G is the centroid and seg CR is the median.

$$\therefore I(GC)/I(RG)=2/1$$

$$\therefore I(GC) \times 1 = 2 \times I(RG) \quad [\because I(RG) = 2.5]$$

$$\therefore I(GC) \times 1 = 2 \times 2.5$$

$$\therefore I(GC) = 5$$

ii. Point G is the centroid and seg BQ is the median.

$$\therefore I(BG)/I(GQ)=2/1$$

$$\therefore 2I(GQ)=I(BG) \quad [\because I(BG) = 6]$$

$$\therefore 2 \times 1 = 2 \times I(GQ)$$

$$\therefore 2 = I(GQ)$$

$$\therefore 2 = I(GQ)$$

$$\therefore I(GQ) = 2$$

$$\text{Now, } I(BQ) = I(BG) + I(GQ)$$

$$\therefore I(BQ) = 6 + 2$$

$$\therefore I(BQ) = 8$$

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iii. Point G is the centroid and seg AP is the median.

$$\therefore I(AG):I(GP)=2:1$$

$$\therefore I(AG) = 2 I(GP) \dots\dots(i)$$

$$\text{Now, } I(AP) = I(AG) + I(GP) \dots (ii)$$

$$\therefore I(AP) = 2I(GP) + I(GP) \dots [\text{From (i)}]$$

$$\therefore I(AP) = 3I(GP)$$

$$\therefore 6 = 3I(GP) \dots[\because I(AP) = 6]$$

$$\therefore 63 = I(GP)$$

$$\therefore 2 = I(GP)$$

$$\text{i.e. } I(GP) = 2$$

$$I(AP) = I(AG) + I(GP) \dots[\text{from (ii)}]$$

$$\therefore 6 = I(AG) + 2$$

$$\therefore I(AG) = 6 - 2$$

$$\therefore I(AG) = 4$$

Intext Questions and Activities

Question 1.

Draw a line. Take a point outside the line. Draw a perpendicular from the point to the line with the help of a set-square (Textbook pg. no, 19)

Solution:

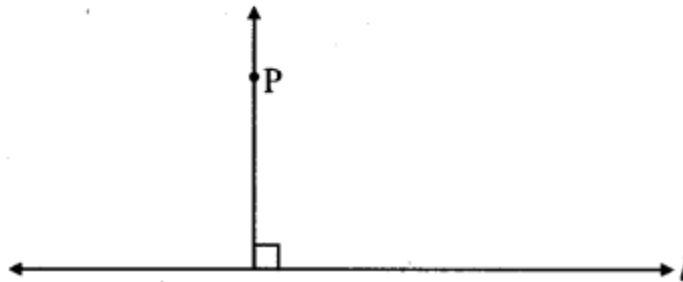
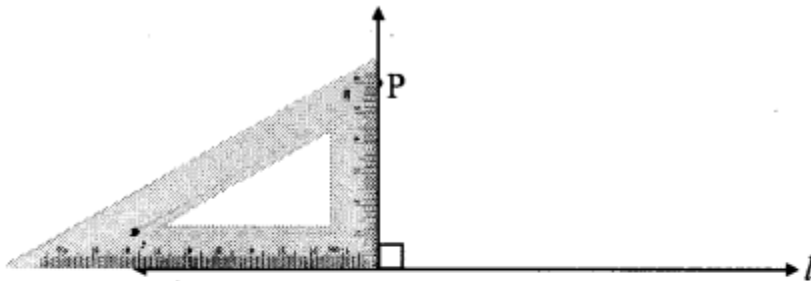
Step 1: Draw a line l and a point P lying outside it.

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• P



Step 2: By placing a set-square on line l , draw a perpendicular to the line from point P.

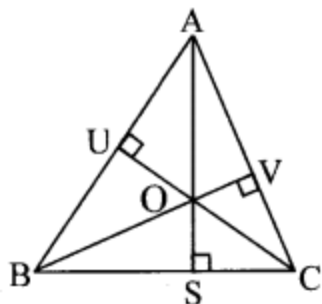


Question 2.

Draw an acute angled $\triangle ABC$ and all its altitudes. Observe the location of the orthocentre.
(Textbook pg. no. 20)

Solution:

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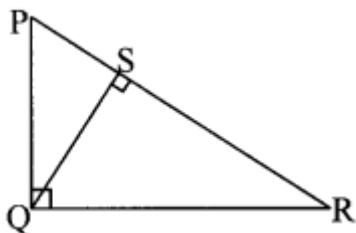
Point O is the orthocentre.

Orthocentre lies in the interior of $\triangle ABC$.

Question 3.

Draw a right angled triangle and draw all its altitudes. Write the point of concurrence.
(Textbook: pg, no. 20)

Solution:



Point Q is the orthocentre.

The point of concurrence of altitudes PQ, QR and QS is Q.

Question 4.

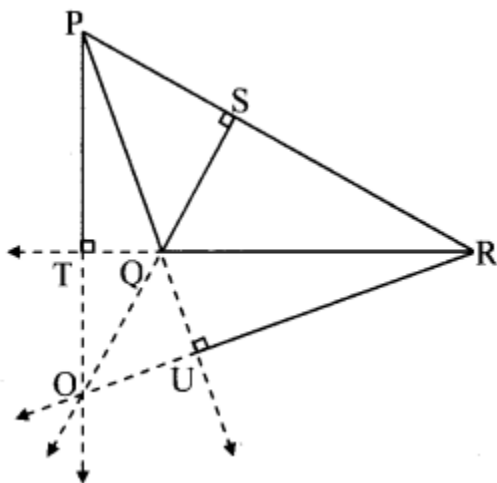
- i. Draw an obtuse angled triangle and all its altitudes.
- ii. Do they intersect each other?

Draw the lines containing the altitudes. Observe that these lines are concurrent. (Textbook pg. no. 20)

Solution:

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i.



Point O is the orthocentre.

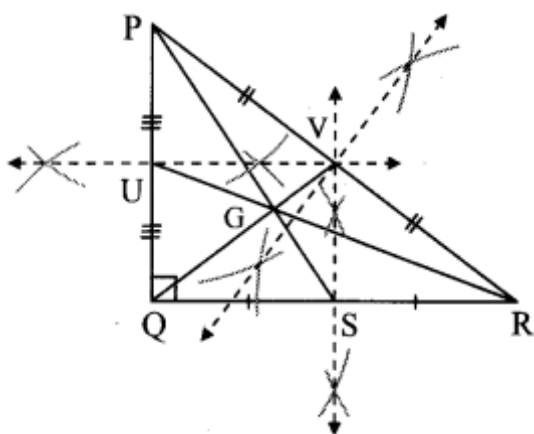
ii. Yes, all the altitudes intersect at point O in the exterior of $\triangle PQR$.

Question 5.

Draw three different triangles; a right angled triangle, an obtuse angled triangle and an acute angled triangle. Draw the medians of the triangles. Note that the centroid of each of them is in the interior of the triangle. (Textbook pg. no. 21)

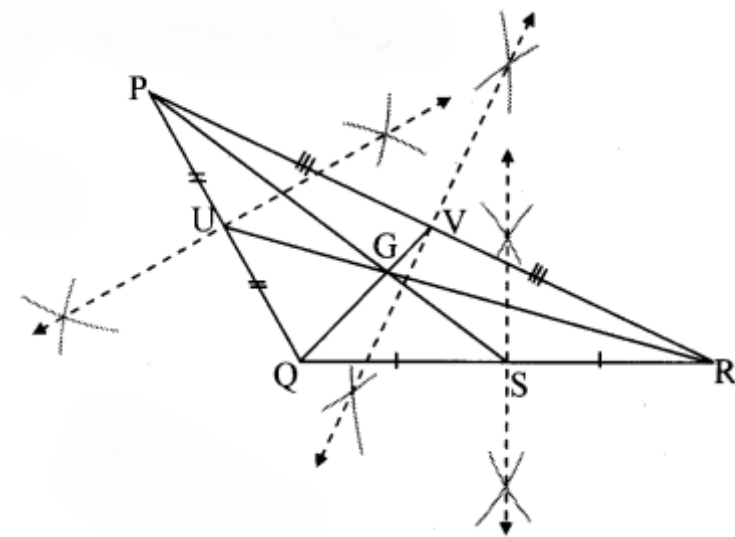
Solution:

i. Right angled triangle:

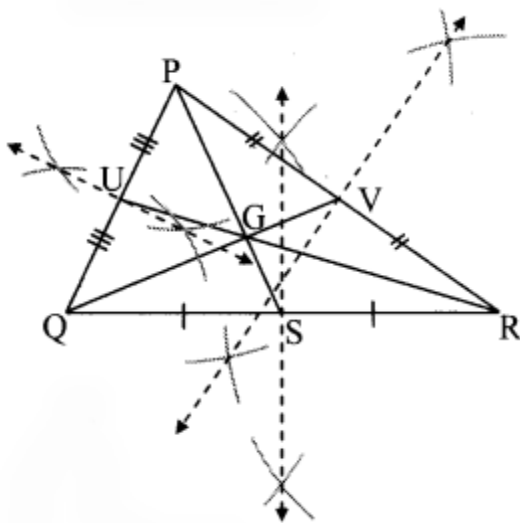


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ii. Obtuse angled triangle:



iii. Acute angled triangle:



Question 6.

Draw a sufficiently large $\triangle ABC$.

Draw medians; seg AR , seg BQ and seg CP of $\triangle ABC$.

Name the point of concurrence as G .

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Measure the lengths of segments from the figure and fill in the boxes in the following table.

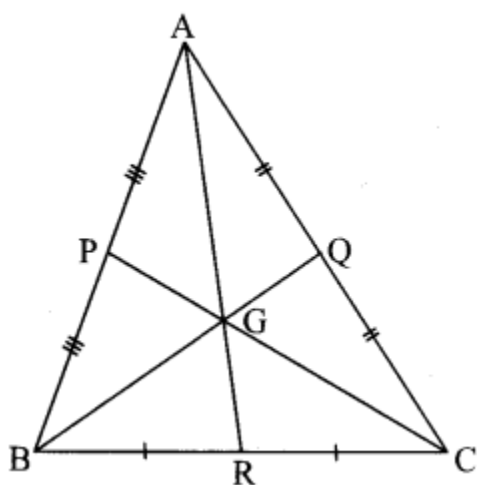
$$\begin{array}{l} I(GR) = \quad I(AG): I(GR) = \\ I(AG) = \end{array}$$

$$I(BG) = \quad I(GQ) = \quad I(BG): I(GQ) =$$

$$I(CG) = \quad I(GP) = \quad I(CG): I(GP) =$$

Observe that all of these ratios are nearly 2 : 1 (Textbook pg. no. 21)

Solution:



$$\begin{array}{l} I(GR) = 1.4 \quad I(AG): I(GR) = 2.8:1.4=2:1 \\ I(AG) = 2.8 \end{array}$$

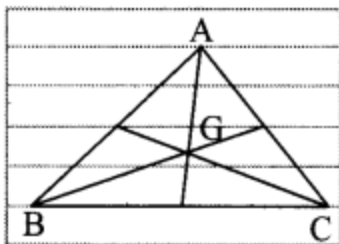
$$I(BG) = 2.4 \quad I(GQ) = 1.2 \quad I(BG): I(GQ) = 2.4:1.2=2:1$$

$$I(CG) = 2.8 \quad I(GP) = 1.4 \quad I(CG): I(GP) = 2.8:1.4=2:1$$

Question 7.

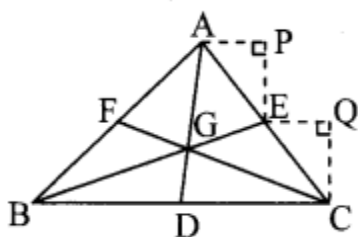
As shown in the given figure, a student drew $\triangle ABC$ using five parallel lines of a notebook. Then he found the centroid G of the triangle. How will you decide whether the location of G he found, is correct. (Textbook pg. no. 21)

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Solution:

Draw seg AP $\perp$ seg PE and seg EQ $\perp$ seg QC.



Side AP $\parallel$ side EQ and AC is their transversal.

$\therefore \angle PAE \cong \angle QEC$... (i) [Corresponding angles]

In $\triangle APE$ and $\triangle EQC$,

$\angle PAE \cong \angle QEC$... [From (i)]

$\angle APE \cong \angle EQC$

... [Each angle is of measure 90°]

side PE $\cong$ side QC

... [Perpendicular distance between parallel lines]

$\therefore \triangle APE \cong \triangle EQC$... [By AAS test]

$\therefore AE = EC$

... [Corresponding sides of congruent triangles]

$\therefore E$ is the midpoint of AC.

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$\therefore$ seg BE is the median.

Similarly, seg CF is the median.

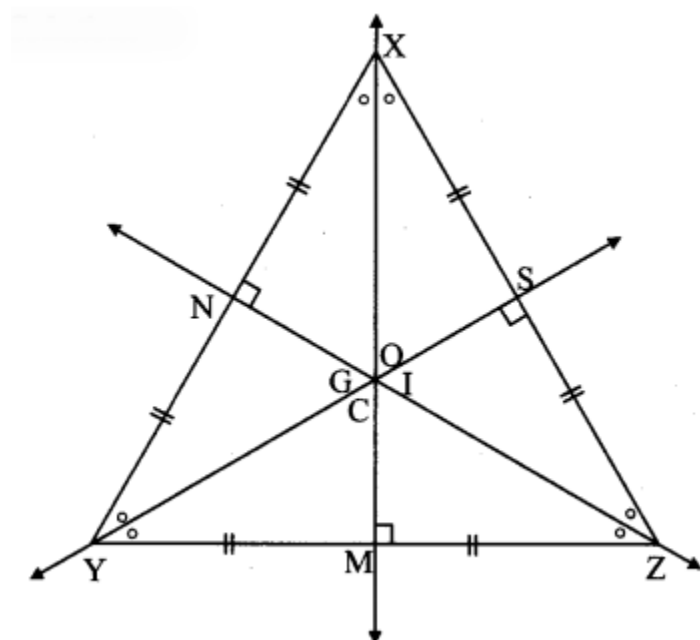
Since, the medians of a triangle are concurrent.

$\therefore$ G is the centroid of $\triangle ABC$.

Question 8.

Draw an equilateral triangle. Find its circumcentre (C), incentre (I), centroid (G) and orthocentre (O). Write your observation. (Textbook pg. no. 22)

Solution:



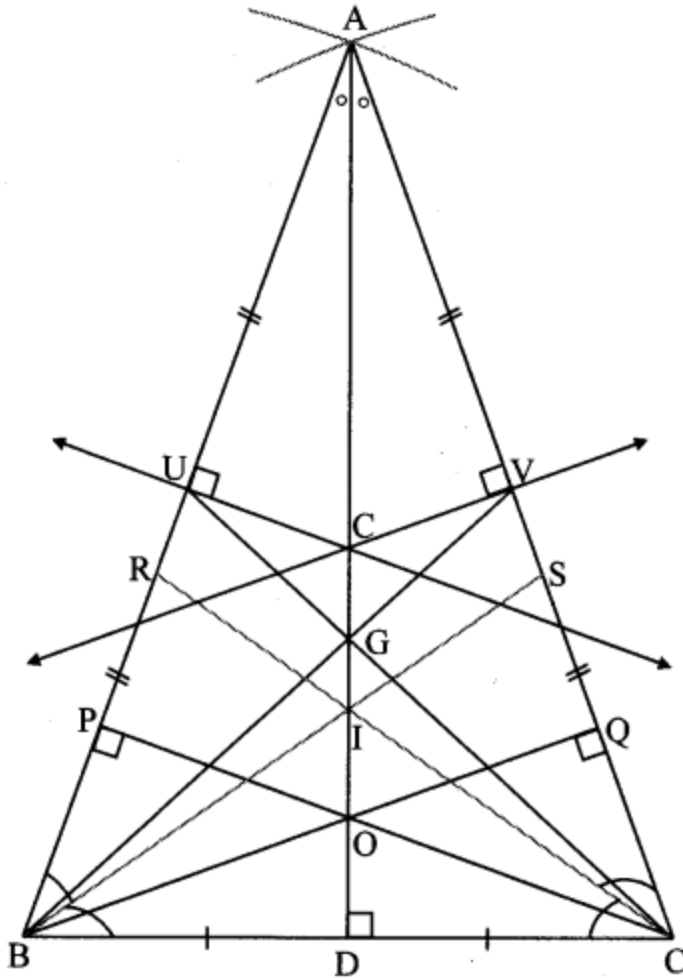
From the figure, circumcentre (C), incentre (I), centroid (G) and orthocentre (O) of an equilateral triangle are the same.

Question 9.

Draw an isosceles triangle. Locate its centroid, orthocentre, circumcentre and incentre. Verify that they are collinear. (Textbook pg. no. 22)

Solution:

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From the figure, centroid (G), orthocentre (O), circumcentre (C) and incentre (I) of an isosceles triangle lie on the same line AD.

$\therefore$ they are collinear.



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- Chapter 1- Rational and Irrational Numbers (Practice Set 1.2)
- Chapter 1- Rational and Irrational Numbers (Practice Set 1.3)
- Chapter 1- Rational and Irrational Numbers (Practice Set 1.4)
- Chapter 2- Parallel Lines and Transversals (Practice Set 2.1)
- Chapter 2- Parallel Lines and Transversals (Practice Set 2.2)
- Chapter 2- Parallel Lines and Transversals (Practice Set 2.3)
- Chapter 3- Indices and Cube Root (Practice Set 3.1)
- Chapter 3- Indices and Cube Root (Practice Set 3.2)
- Chapter 3- Indices and Cube Root (Practice Set 3.3)
- Chapter 4- Altitudes and Medians of a Triangle (Practice Set 4.1)
- Chapter 5- Expansion Formulae (Practice Set 5.1)
- Chapter 5- Expansion Formulae (Practice Set 5.2)
- Chapter 5- Expansion Formulae (Practice Set 5.3)
- Chapter 5- Expansion Formulae (Practice Set 5.4)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.1)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.2)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.3)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.4)
- Chapter 7- Variation (Practice Set 7.1)

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- Chapter 7- Variation (Practice Set 7.2)
- Chapter 7- Variation (Practice Set 7.3)
- Chapter 8- Quadrilateral: Constructions and Types (Practice Set 8.1)
- Chapter 8- Quadrilateral: Constructions and Types (Practice Set 8.2)
- Chapter 8- Quadrilateral: Constructions and Types (Practice Set 8.3)
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- Chapter 9- Discount and Commission (Practice Set 9.2)
- Chapter 10- Division of Polynomials (Practice Set 10.1)
- Chapter 10- Discount and Commission (Practice Set 10.2)
- Chapter 11- Statistics (Practice Set 11.1)
- Chapter 11- Statistics (Practice Set 11.2)
- Chapter 11- Statistics (Practice Set 11.3)
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- Chapter 12- Equations in One Variable (Practice Set 12.2)
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- Chapter 13- Congruence of Triangles (Practice Set 13.2)
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- Chapter 15- Area (Practice Set 15.3)
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- Chapter 16- Surface Area and Volume (Practice Set 16.2)
- Chapter 16- Surface Area and Volume (Practice Set 16.3)
- Chapter 17- Factorisation of Algebraic Expressions (Practice Set 17.1)
- Chapter 17- Factorisation of Algebraic Expressions (Practice Set 17.2)

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The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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FAQs

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How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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