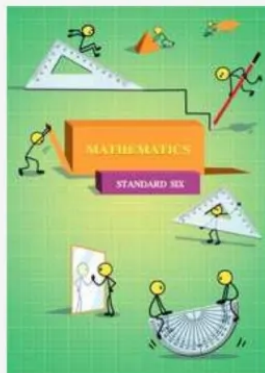


Maharashtra Board Solutions Class 6-Maths (Practice Set 36): Chapter 15- Triangles and their Properties

BOOK SOLUTIONS
CLASS 6
MATHS

CHAPTER 15
**Triangles and their
Properties**



Maharashtra Board Solutions→

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Maharashtra Board Solutions Class 6-Maths (Practice Set 36): Chapter 15- Triangles and their Properties

Class 6: Maths Chapter 15 solutions. Complete Class 6 Maths Chapter 15 Notes.

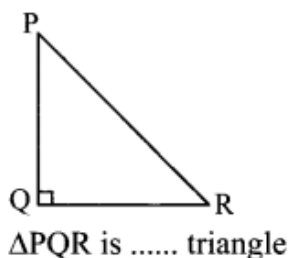
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Maharashtra Board 6th Maths Chapter 15, Class 6 Maths Chapter 15 solutions

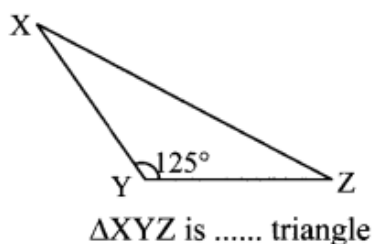
Question 1.

Observe the figures below and write the type of the triangle based on its angles:

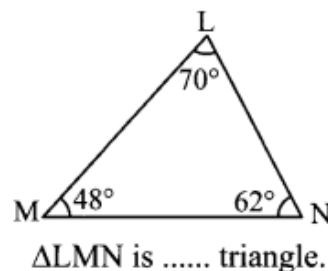
i.



ii.



iii.



Solution:

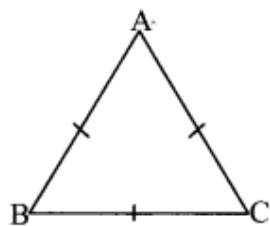
- i. right angled
- ii. Obtuse angled
- iii. acute angled

Question 2.

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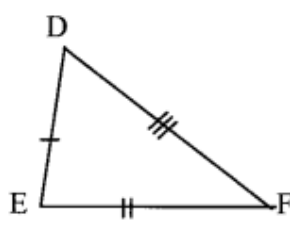
Observe the figures below and write the type of the triangle based on its sides:

i



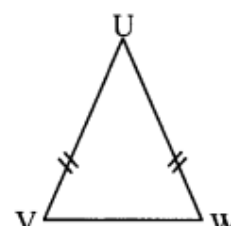
$\triangle ABC$ is triangle.

ii



$\triangle DEF$ is triangle.

iii



$\triangle UVW$ is triangle.

Solution:

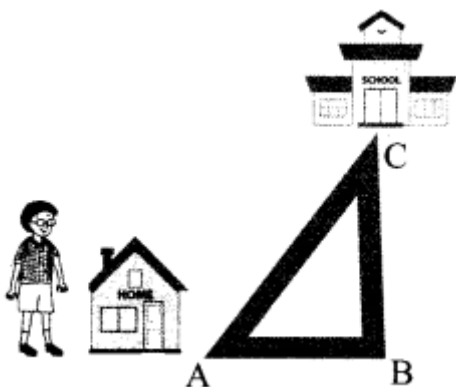
i. equilateral

ii. scalene

iii. isosceles

Question 3.

As shown in the figure, Avinash is standing near his house. He can choose from two roads to go to school. Which way is shorter? Explain why.



Solution:

The two roads which Avinash can choose to go to school are

1. Road AB + Road BC

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2. Road AC

The three roads together form $\triangle ABC$.

Road AC is shorter because the sum of the lengths of any two sides (side AB + side BC) of a triangle is always greater than the third side (side AC).

Question 4.

The lengths of the sides of some triangles are given. Say what types of triangles they are.

1. 3 cm, 4 cm, 5 cm
2. 3.4 cm, 3.4 cm, 5 cm
3. 4.3 cm, 4.3 cm, 4.3 cm
4. 3.7 cm, 3.4 cm, 4 cm

Solution:

1. Since, no two sides have equal lengths, the given triangle is a scalene triangle.
2. Since, two sides have equal length, the given triangle is an isosceles triangle.
3. Since, all the three sides have equal lengths, the given triangle is an equilateral triangle.
4. Since, no two sides have equal lengths, the given triangle is a scalene triangle.

Question 5.

The lengths of the three segments are given for constructing a triangle. Say whether a triangle with these sides can be drawn. Give the reason for your answer.

- i. 17 cm, 7 cm, 8 cm
- ii. 7 cm, 24 cm, 25 cm
- iii. 9 cm, 6 cm, 16 cm
- iv. 8.4 cm, 16.4 cm, 4.9 cm
- v. 15 cm, 20 cm, 25 cm
- vi. 12 cm, 12 cm, 16 cm

Solution:

- i. The lengths of the three sides are 17 cm, 7 cm, 8 cm.

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- a. $7\text{ cm} + 17\text{ cm} = 24\text{ cm}$, greater than 8 cm
- b. $8\text{ cm} + 17\text{ cm} = 25\text{ cm}$, greater than 7 cm
- c. $7\text{ cm} + 8\text{ cm} = 15\text{ cm}$, not greater than 17 cm

The sum of lengths of two sides in (c) is not greater than the length of the third side.

$\therefore$ Triangle cannot be drawn with sides 17 cm , 7 cm , 8 cm .

- ii. The lengths of the three sides are 7 cm , 24 cm , 25 cm .

- a. $7\text{ cm} + 24\text{ cm} = 31\text{ cm}$, greater than 25 cm
- b. $25\text{ cm} + 7\text{ cm} = 32\text{ cm}$, greater than 24 cm
- c. $24\text{ cm} + 25\text{ cm} = 49\text{ cm}$, greater than 7 cm

The sum of lengths of two sides is greater than the length of the third side.

$\therefore$ Triangle can be drawn with sides 7 cm , 24 cm , 25 cm .

- iii. The lengths of the three sides are 9 cm , 6 cm , 16 cm .

- a. $9\text{ cm} + 16\text{ cm} = 25\text{ cm}$, greater than 6 cm
- b. $6\text{ cm} + 16\text{ cm} = 22\text{ cm}$, greater than 9 cm
- c. $9\text{ cm} + 6\text{ cm} = 15\text{ cm}$, not greater than 16 cm

The sum of lengths of two sides in (c) is not greater than the length of the third side.

$\therefore$ Triangle cannot be drawn with sides 9 cm , 6 cm , 16 cm .

- iv. The lengths of the three sides are 8.4 cm , 16.4 cm , 4.9 cm .

- a. $8.4\text{ cm} + 16.4\text{ cm} = 24.8\text{ cm}$, greater than 4.9 cm
- b. $4.9\text{ cm} + 16.4\text{ cm} = 21.3\text{ cm}$, greater than 8.4 cm
- c. $8.4\text{ cm} + 4.9\text{ cm} = 13.3\text{ cm}$, not greater than 16.4 cm

The sum of lengths of two sides in (c) is not greater than the length of the third side.

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∴ Triangle cannot be drawn with sides 8.4 cm, 16.4 cm, 4.9 cm.

v. The lengths of the three sides are 15 cm, 20 cm, 25 cm.

a. $15\text{ cm} + 20\text{ cm} = 35\text{ cm}$, greater than 25 cm

b. $25\text{ cm} + 20\text{ cm} = 45\text{ cm}$, greater than 15 cm

c. $15\text{ cm} + 25\text{ cm} = 40\text{ cm}$, greater than 20 cm

The sum of lengths of two sides is greater than the length of the third side.

∴ Triangle can be drawn with sides 15 cm, 20 cm, 25 cm.

vi. The lengths of the three sides are 12 cm, 12 cm, 16 cm.

a. $12\text{ cm} + 12\text{ cm} = 24\text{ cm}$, greater than 16 cm

b. $12\text{ cm} + 16\text{ cm} = 28\text{ cm}$, greater than 12 cm

c. $12\text{ cm} + 16\text{ cm} = 28\text{ cm}$, greater than 12 cm

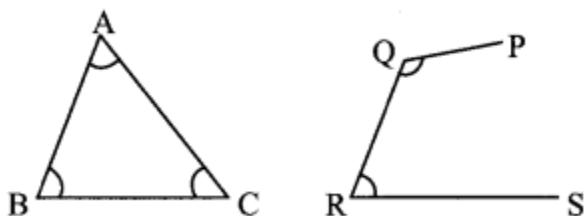
The sum of lengths of two sides is greater than the length of the third side.

∴ Triangle can be drawn with sides 12 cm, 12 cm, 16 cm.

Questions and Activities

Question 1.

In the given figure, some points and some line segments joining them have been drawn. Which of these figures is a triangle? Which figure is not a triangle? Why not? (Textbook pg. no. 77)



Solution:

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ABC it is a closed figure with three sides. Hence, ABC is a triangle.

PQRS has three sides but it is not a closed figure. Hence, PQRS is not a triangle.

Question 2.

As seen above, $\triangle ABC$ has three sides. Line segment AB is one side. Write the names of the other two sides. $\triangle ABC$ has three angles. $\angle ABC$ is one among them. Write the names of the other angles. (Textbook pg. no. 77)

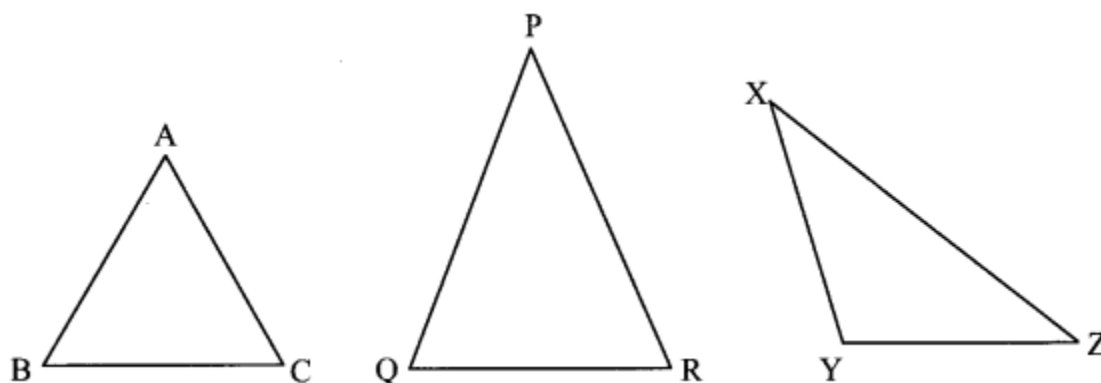
Solution:

The names of other two sides are: seg BC and seg AC

The names of other angles are: $\angle BCA$ and $\angle CAB$

Question 3.

Measure the sides of the following triangles in centimeters, using a divider and ruler. Enter the lengths in the table below. What do you observe? (Textbook pg. no. 77)



In $\triangle ABC$	In $\triangle PQR$	In $\triangle XYZ$
$I(AB) =$ cm	$I(QR) =$ cm	$I(XY) =$ cm
$I(BC) =$ cm	$I(PQ) =$ cm	$I(YZ) =$ cm

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$l(AC) =$ $l(PR) =$ cm $l(XZ) =$ cm
 cm

Solution:

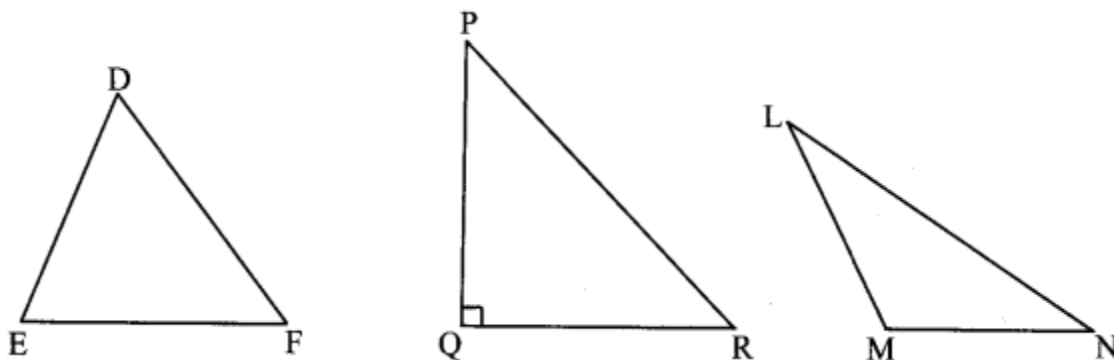
In $\triangle ABC$	In $\triangle PQR$	In $\triangle XYZ$
$l(AB) = 2.6$ cm	$l(QR) = 2.8$ cm	$l(XY) = 2.8$ cm
$l(BC) = 2.6$ cm	$l(PQ) = 3.8$ cm	$l(YZ) = 2.6$ cm
$l(AC) = 2.6$ cm	$l(PR) = 3.8$ cm	$l(XZ) = 4.3$ cm

We observe that,

1. $\triangle ABC$ is an equilateral triangle,
2. $\triangle PQR$ is an isosceles triangle, and
3. $\triangle XYZ$ is a scalene triangle.

Question 4.

Measure all the angles of the triangles given below. Enter them in the following table.
 (Textbook pg. no. 78)



In $\triangle DEF$	In $\triangle PQR$	In $\triangle LMN$
--------------------	--------------------	--------------------

Measure of $\angle D = m \angle D = \underline{\hspace{1cm}}$ Measure of $\angle P = m \angle P = \underline{\hspace{1cm}}$ Measure of $\angle L = \underline{\hspace{1cm}}$

Measure of $\angle E = m \angle E = \underline{\hspace{1cm}}$ Measure of $\angle Q = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ Measure of $\angle M = \underline{\hspace{1cm}}$

Measure of $\angle F = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ Measure of $\angle R = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ Measure of $\angle N = \underline{\hspace{1cm}}$

Observation:
All three angles are acute angles.

Observation:
One angle is right angle and two are acute angles.

Observation:
One angle is an obtuse angle and two are acute.

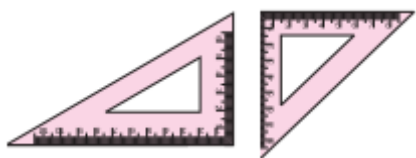
Solution:

In $\triangle DEF$	In $\triangle PQR$	In $\triangle LMN$
Measure of $\angle D = m \angle D = 60^\circ$	Measure of $\angle P = m \angle P = 45^\circ$	Measure of $\angle L = 30^\circ$
Measure of $\angle E = m \angle E = 68^\circ$	Measure of $\angle Q = m \angle Q = 90^\circ$	Measure of $\angle M = 116^\circ$
Measure of $\angle F = m \angle F = 52^\circ$	Measure of $\angle R = m \angle R = 45^\circ$	Measure of $\angle N = 34^\circ$

1. ADEF is an acute angled triangle,
2. APQR is a right angled triangle,
3. ALMN is an obtuse angled triangle.

Question 5.

Observe the set squares in your compass box. What kind of triangles are they?
(Textbook pg. no. 78)



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Solution:

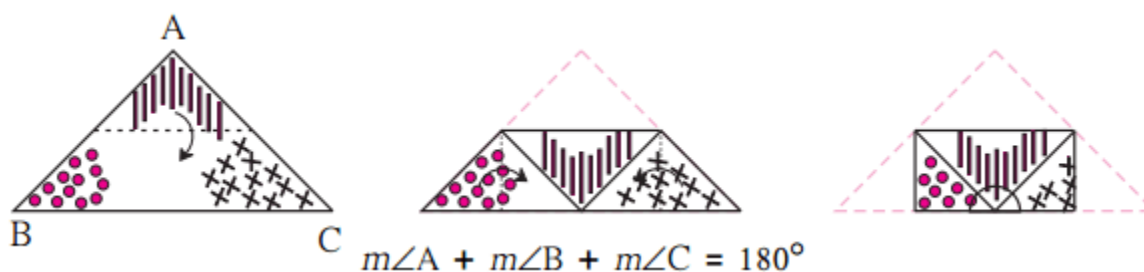
The first set square is a scalene triangle and also a right angled triangle.

The second set square is an isosceles triangle and also a right angled triangle.

Question 6.

Properties of a triangle. (Textbook pg. no. 79)

Take a triangular piece of paper. Choose three different colors or signs to mark the three corners of the triangle on both sides of the paper. Fold the paper at the midpoints of two sides as observe?

**Solution:**

The three angles of the triangle form a straight angle.

$$\therefore m\angle A + m\angle B + m\angle C = 180^\circ$$

Hence, the sum of the measures of the angles of a triangle is 180° .

Question 7.

Properties of a triangle (Textbook pg. no. 79)

Take a triangular piece of paper and make three different types of marks near the three angles. Take a point approximately at the center of the triangle. From this point, draw three lines that meet the three sides. Cut the paper along those lines. Place the three angles side by side as shown. See how the three angles of a triangle together form a straight angle, or, an angle that measures 180° .

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Solution:

The three angles of the triangle form a straight angle.

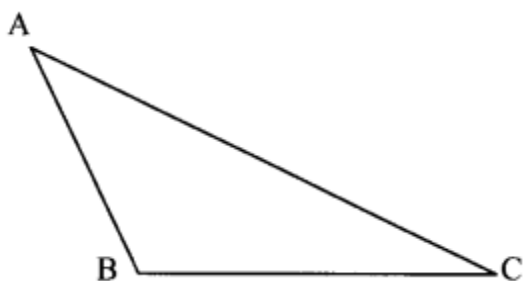
Hence, the sum of the measures of the angles of a triangle is 180° .

Question 8.

Draw any triangle on a paper. Name its vertices A, B, C. Measure the lengths of its three sides using a divider and scale and enter them in the table. (Textbook pg. no. 79)

Length of side	Sum of the lengths of two sides	Length of the third side
I (AB) = cm	I (AB) + I (BC) = cm	I (AC) = cm
I (BC) = cm	I (BC) + I (AC) = cm	I (AB) = cm
I (AC) = cm	I (AC) + I (AB) = cm	I (BC) = cm

Solution:



Length of side	Sum of the lengths of two sides	Length of the third side
$l(AB) = 2.7 \text{ cm}$	$l(AB) + l(BC) = 6.6 \text{ cm}$	$l(AC) = 5.6 \text{ cm}$
$l(BC) = 2.9 \text{ cm}$	$l(BC) + l(AC) = 9.5 \text{ cm}$	$l(AB) = 2.7 \text{ cm}$
$l(AC) = 5.6 \text{ cm}$	$l(AC) + l(AB) = 8.3 \text{ cm}$	$l(BC) = 3.9 \text{ cm}$



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- Chapter 2- Angles (Practice Set 2)
- Chapter 2- Angles (Practice Set 3)
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- Chapter 3- Integers (Practice Set 5)
- Chapter 3- Integers (Practice Set 6)
- Chapter 3- Integers (Practice Set 7)
- Chapter 3- Integers (Practice Set 8)
- Chapter 4- Operations on Fractions (Practice Set 9)
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- Chapter 4- Operations on Fractions (Practice Set 11)
- Chapter 4- Operations on Fractions (Practice Set 12)
- Chapter 4- Operations on Fractions (Practice Set 13)
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- Chapter 5- Decimal Fractions (Practice Set 16)
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- Chapter 7- Symmetry (Practice Set 20)
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- Chapter 9- HCF-LCM (Practice Set 24)
- Chapter 9- HCF-LCM (Practice Set 25)
- Chapter 10- Equations (Practice Set 26)
- Chapter 10- Equations (Practice Set 27)
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- Chapter 11- Ratio-Proportion (Practice Set 29)
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- Chapter 13- Profit-Loss (Practice Set 33)
- Chapter 13- Profit-Loss (Practice Set 34)
- Chapter 14- Banks and Simple Interest (Practice Set 35)
- Chapter 15- Triangles and their Properties (Practice Set 36)
- Chapter 16- Quadrilaterals (Practice Set 37)
- Chapter 16- Quadrilaterals (Practice Set 38)
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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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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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