RS Aggarwal Solutions Class 9 Maths Chapter 8: RS Aggarwal Solutions Class 9 Maths Chapter 8 focuses on triangles. It covers different aspects of triangles, like their properties and types. The chapter provides clear explanations and step-by-step solutions to help students understand these concepts easily.

By studying Chapter 8, students can learn important concepts such as the Pythagorean theorem and criteria for congruence and similarity of triangles. Practicing the exercises in this chapter can enhance problem-solving skills and boost confidence in dealing with triangle-related problems.

RS Aggarwal Solutions Class 9 Maths Chapter 8 PDF

You can access the PDF for RS Aggarwal Solutions Class 9 Maths Chapter 8 by clicking on the link provided below. This PDF contains detailed solutions to the exercises and problems covered in the chapter, making it easier for students to understand and practice triangle-related concepts.

RS Aggarwal Solutions Class 9 Maths Chapter 8 PDF

RS Aggarwal Solutions Class 9 Maths Chapter 8

The solutions for RS Aggarwal Class 9 Maths Chapter 8 are provided below. These solutions cover various topics related to triangles and offer step-by-step explanations to help students understand the concepts better.

By referring to these solutions, students can clarify their doubts and strengthen their understanding of triangle geometry.

RS Aggarwal Solutions Class 9 Chapter 8 Triangles Exercise- 8.8

Question 1.

Solution:

Since, sum of the angles of a triangle is 180o
∠A + ∠B + ∠C = 180o
⇒ ∠A + 76o + 48o = 180o
⇒ ∠A = 180o – 124o = 56o
∴ ∠A = 56o

Question 2.

Solution:

Let the measures of the angles of a triangle are $(2x)^o$

, $(3x)^o$ and $(4x)^o$
.
Then, 2x + 3x + 4x = 180 [sum of the angles of a triangle is 180^o
]

⇒ 9x = 180
⇒ x = 180/9= 20
∴ The measures of the required angles are:
$2x = (2 \times 20)^o = 40^o$
$3x = (3 \times 20)^o = 60^o$
$4x = (4 \times 20)^o = 80^o$
Question 3.
Solution:
Let 3∠A = 4∠B = 6∠C = x (say)
Then, 3∠A = x
⇒ ∠A = x/3
4∠B = x
⇒ ∠B = x/4
and 6∠C = x
⇒ ∠C = x/6

As ∠A + ∠B + ∠C = 180°

$$\Rightarrow \quad \frac{x}{3} + \frac{x}{4} + \frac{x}{6} = 180$$

$$\Rightarrow \frac{4x + 3x + 2x}{12} = 180$$

$$\Rightarrow \quad 9x = 180 \times 12$$

$$\Rightarrow \quad x = \frac{180 \times 12}{9} = 240$$

$$\therefore \angle A = \frac{x}{3} = \frac{240}{3} = 80^\circ$$

$$\angle B = \frac{x}{4} = \frac{240}{4} = 60^\circ$$

$$\angle C = \frac{x}{6} = \frac{240}{6} = 40^\circ$$

Question 4

Solution:

∠A + ∠B = 108° [Given]

But as ∠A, ∠B and ∠C are the angles of a triangle,

∠A + ∠B + ∠C = 180°

⇒ 108° + ∠C = 180°

⇒ C = 180° – 108° = 72°

Also, ∠B + ∠C = 130° [Given]

⇒ ∠B + 72° = 130°

⇒ ∠B = 130° – 72° = 58°

Now as, ∠A + ∠B = 108°

⇒ ∠A + 58° = 108°

⇒ ∠A = 108° – 58° = 50°

∴ ∠A = 50°, ∠B = 58° and ∠C = 72°.

Question 5.

Solution:

Since. ∠A , ∠B and ∠C are the angles of a triangle .

So, ∠A + ∠B + ∠C = 180^o

Now, ∠A + ∠B = 125^o [Given]

∴ 125^o + ∠C = 180^o

⇒ ∠C = 180^o – 125^o = 55^o

Also, ∠A + ∠C = 113^o [Given]

⇒ ∠A + 55^o = 113^o

⇒ ∠A = 113^o – 55^o = 58^o

Now as ∠A + ∠B = 125^o

⇒ 58^o + ∠B = 125^o

⇒ ∠B = 125^o – 58^o = 67^o

∴ ∠A = 58^o, ∠B = 67^o and ∠C = 55^o.

Question 6.

Solution:

Since, ∠P, ∠Q and ∠R are the angles of a triangle.

So, ∠P + ∠Q + ∠R = 180^o ….(i)

Now, ∠P – ∠Q = 42^o [Given]

⇒ ∠P = 42^o + ∠Q ….(ii)

and ∠Q – ∠R = 21^o [Given]

⇒ ∠R = ∠Q – 21^o ….(iii)

Substituting the value of ∠P and ∠R from (ii) and (iii) in (i), we get,

⇒ 42^o + ∠Q + ∠Q + ∠Q – 21^o = 180^o

⇒ 3∠Q + 21^o = 180^o

⇒ 3∠Q = 180^o – 21^o = 159^o

∠Q = 159/3= 53^o

∴ ∠P = 42^o + ∠Q

= 42^o + 53^o = 95^o

∠R = ∠Q – 21^o

= 53^o – 21^o = 32^o

∴ ∠P = 95^o, ∠Q = 53^o and ∠R = 32^o.

Question 7.

Solution:

Given that the sum of the angles A and B of a ABC is 116°, i.e., $\angle A + \angle B = 116^\circ$.

Since, $\angle A + \angle B + \angle C = 180^\circ$

So, $116^\circ + \angle C = 180^\circ$

$\Rightarrow \angle C = 180^\circ - 116^\circ = 64^\circ$

Also, it is given that:

$\angle A - \angle B = 24^\circ$

$\Rightarrow \angle A = 24^\circ + \angle B$

Putting, $\angle A = 24^\circ + \angle B$ in $\angle A + \angle B = 116^\circ$, we get,

$\Rightarrow 24^\circ + \angle B + \angle B = 116^\circ$

$\Rightarrow 2\angle B + 24^\circ = 116^\circ$

$\Rightarrow 2\angle B = 116^\circ - 24^\circ = 92^\circ$

$\angle B = 92/2 = 46^\circ$

Therefore, $\angle A = 24^\circ + 46^\circ = 70^\circ$

$\therefore \angle A = 70^\circ$, $\angle B = 46^\circ$ and $\angle C = 64^\circ$.

Question 8.

Solution:

Let the two equal angles, A and B, of the triangle be x° each.

We know,

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

$\Rightarrow x^\circ + x^\circ + \angle C = 180^\circ$

$\Rightarrow 2x^\circ + \angle C = 180^\circ$ ….(i)

Also, it is given that,

$\angle C = x^\circ + 18^\circ$ ….(ii)

Substituting $\angle C$ from (ii) in (i), we get,

$\Rightarrow 2x^\circ + x^\circ + 18^\circ = 180^\circ$

$\Rightarrow 3x^\circ = 180^\circ - 18^\circ = 162^\circ$

$x = \quad = 54^\circ$

Thus, the required angles of the triangle are 54°, 54° and $x^\circ + 18^\circ = 54^\circ + 18^\circ = 72^\circ$.

Question 9.

Solution:

Let ∠C be the smallest angle of ABC.

Then, ∠A = 2∠C and B = 3∠C

Also, ∠A + ∠B + ∠C = 180o

⇒ 2∠C + 3∠C + ∠C = 180o

⇒ 6∠C = 180o

⇒ ∠C = 30o

So, ∠A = 2∠C = 2 (30o
) = 60o

∠B = 3∠C = 3 (30o
) = 90o

Question 10.

Solution:
Let ABC be a right angled triangle and ∠C = 90°
Since, ∠A + ∠B + ∠C = 180°
⇒ ∠A + ∠B = 180° – ∠C = 180° – 90° = 90°
Suppose ∠A = 53°
Then, 53° + ∠B = 90°
⇒ ∠B = 90° – 53° = 37°
∴ The required angles are 53°, 37° and 90°.

Question 11.

Solution:
Let ABC be a triangle.
Given, ∠A + ∠B = ∠C
We know, ∠A + ∠B + ∠C = 180°
⇒ ∠C + ∠C = 180°
⇒ 2∠C = 180°
⇒ ∠C = 180/2= 90°
So, we find that ABC is a right triangle, right angled at C.

Question 12.

Solution:

Given : ∆ABC in which ∠A = 90o

, AL ⊥ BC

To Prove: ∠BAL = ∠ACB
Proof :
In right triangle ∆ABC,
⇒ ∠ABC + ∠BAC + ∠ACB = 180o
⇒ ∠ABC + 90o + ∠ACB = 180o
⇒ ∠ABC + ∠ACB = 180o – 90o
∴ ∠ABC + ∠ACB = 90o
⇒ ∠ ACB = 90o – ∠ABC ....(1)
Similarly since ∆ABL is a right triangle, we find that,
∠BAL = 90o – ∠ABC ...(2)

Thus from (1) and (2), we have
∴ ∠BAL = ∠ACB (Proved)

Question 13.

Solution:

Let ABC be a triangle.
So, ∠A < ∠B + ∠C
Adding A to both sides of the inequality,
⇒ 2∠A < ∠A + ∠B + ∠C
⇒ 2∠A < 180o

[Since ∠A + ∠B + ∠C = 180
o
]

⇒ ∠A < 180/2 = 90o
Similarly, ∠B < ∠A + ∠C
⇒ ∠B < 90o
and ∠C < ∠A + ∠B
⇒ ∠C < 90o
∆ABC is an acute angled triangle.

Question 14.

Solution:

Let ABC be a triangle and ∠B > ∠A + ∠C
Since, ∠A + ∠B + ∠C = 180o
⇒ ∠A + ∠C = 180o – ∠B
Therefore, we get
∠B > 180o – ∠B
Adding ∠B on both sides of the inequality, we get,
⇒ ∠B + ∠B > 180o – ∠B + ∠B

⇒ 2∠B > 180o
⇒ ∠B > 180/2= 90o
i.e., ∠B > 90o which means ∠B is an obtuse angle.
∆ABC is an obtuse angled triangle.

Question 15.

Solution:

Since ∠ACB and ∠ACD form a linear pair.
So, ∠ACB + ∠ACD = 180°
⇒ ∠ACB + 128° = 180°
⇒ ∠ACB = 180° – 128 = 52°
Also, ∠ABC + ∠ACB + ∠BAC = 180°
⇒ 43° + 52° + ∠BAC = 180°
⇒ 95° + ∠BAC = 180°
⇒ ∠BAC = 180° – 95° = 85°
∴ ∠ACB = 52° and ∠BAC = 85°.

Question 16.

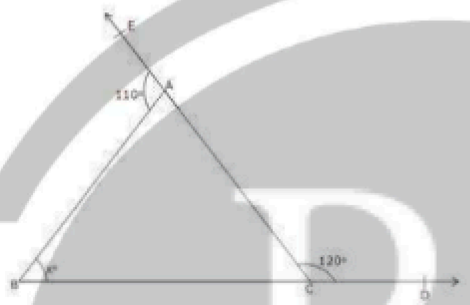
Solution:

As ∠DBA and ∠ABC form a linear pair.
So, ∠DBA + ∠ABC = 180°
⇒ 106° + ∠ABC = 180°
⇒ ∠ABC = 180° – 106° = 74°
Also, ∠ACB and ∠ACE form a linear pair.
So, ∠ACB + ∠ACE = 180°
⇒ ∠ACB + 118° = 180°
⇒ ∠ACB = 180° – 118° = 62°
In ∠ABC, we have,
∠ABC + ∠ACB + ∠BAC = 180°
74° + 62° + ∠BAC = 180°
⇒ 136° + ∠BAC = 180°
⇒ ∠BAC = 180° – 136° = 44°
∴ In triangle ABC, ∠A = 44°, ∠B = 74° and ∠C = 62°

Question 17.

Solution:

(i) ∠EAB + ∠BAC = 180° [Linear pair angles]



110° + ∠BAC = 180°

⇒ ∠BAC = 180° – 110° = 70°

Again, ∠BCA + ∠ACD = 180° [Linear pair angles]

⇒ ∠BCA + 120° = 180°

⇒ ∠BCA = 180° – 120° = 60°

Now, in ΔABC,

∠ABC + ∠BAC + ∠ACB = 180°

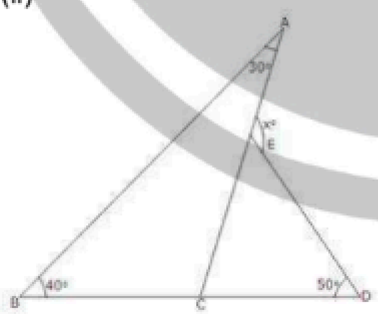
x° + 70° + 60° = 180°

⇒ x + 130° = 180°

⇒ x = 180° – 130° = 50°

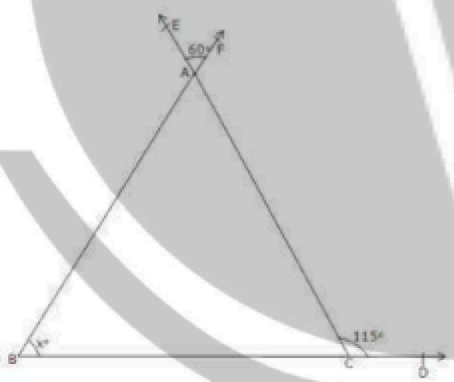
∴ x = 50

(ii)



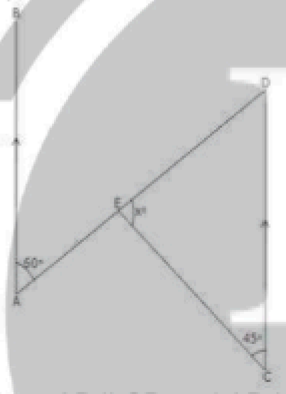
In ΔABC,

$\angle A + \angle B + \angle C = 180^o$
$\Rightarrow 30^o + 40^o + \angle C = 180^o$
$\Rightarrow 70^o + \angle C = 180^o$
$\Rightarrow \angle C = 180^o - 70^o = 110^o$
Now $\angle BCA + \angle ACD = 180^o$ [Linear pair]
$\Rightarrow 110^o + \angle ACD = 180^o$
$\Rightarrow \angle ACD = 180^o - 110^o = 70^o$
In ΔECD,
$\Rightarrow \angle ECD + \angle CDE + \angle CED = 180^o$
$\Rightarrow 70^o + 50^o + \angle CED = 180^o$
$\Rightarrow 120^o + \angle CED = 180^o$
$\angle CED = 180^o - 120^o = 60^o$
Since $\angle AED$ and $\angle CED$ from a linear pair
So, $\angle AED + \angle CED = 180^o$
$\Rightarrow x^o + 60^o = 180^o$
$\Rightarrow x^o = 180^o - 60^o = 120^o$
$\therefore x = 120$
(iii)

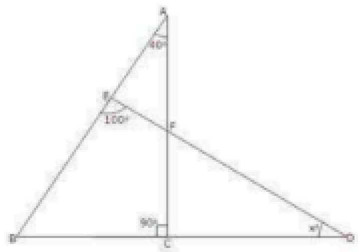


$\angle EAF = \angle BAC$ [Vertically opposite angles]

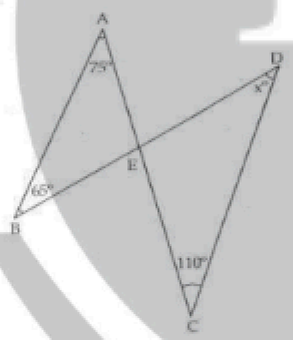
⇒ ∠BAC = 60°
In ∆ABC, exterior ∠ACD is equal to the sum of two opposite interior angles.
So, ∠ACD = ∠BAC + ∠ABC
⇒ 115° = 60° + x°
⇒ x° = 115° – 60° = 55°
∴ x = 55
(iv)



Since AB || CD and AD is a transversal.
So, ∠BAD = ∠ADC
⇒ ∠ADC = 60°
In ∠ECD, we have,
∠E + ∠C + ∠D = 180°
⇒ x° + 45° + 60° = 180°
⇒ x° + 105° = 180°
⇒ x° = 180° – 105° = 75°
∴ x = 75
(v)



In ΔAEF,
Exterior ∠BED = ∠EAF + ∠EFA
⇒ 100° = 40° + ∠EFA
⇒ ∠EFA = 100° – 40° = 60°
Also, ∠CFD = ∠EFA [Vertically Opposite angles]
⇒ ∠CFD = 60°
Now in ΔFCD,
Exterior ∠BCF = ∠CFD + ∠CDF
⇒ 90° = 60° + x°
⇒ x° = 90° – 60° = 30°
∴ x = 30

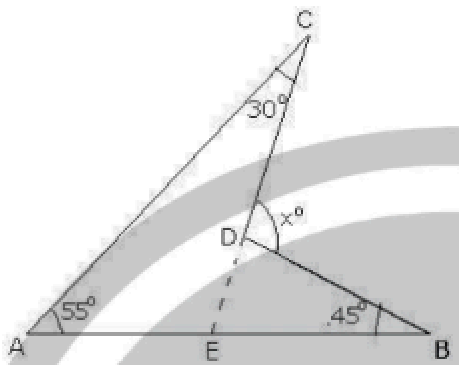


In ΔABE, we have,
∠A + ∠B + ∠E = 180°
⇒ 75° + 65° + ∠E = 180°
⇒ 140° + ∠E = 180°
⇒ ∠E = 180° – 140° = 40°
Now, ∠CED = ∠AEB [Vertically opposite angles]
⇒ ∠CED = 40°
Now, in ΔCED, we have,
∠C + ∠E + ∠D = 180°
⇒ 110° + 40° + x° = 180°
⇒ 150° + x° = 180°
⇒ x° = 180° – 150° = 30°
∴ x = 30

Question 18.

Solution:

Produce CD to cut AB at E.



Now, in ΔBDE, we have,

Exterior ∠CDB = ∠CEB + ∠DBE

⇒ x° = ∠CEB + 45° .....(i)

In ΔAEC, we have,

Exterior ∠CEB = ∠CAB + ∠ACE

= 55° + 30° = 85°

Putting ∠CEB = 85° in (i), we get,

x° = 85° + 45° = 130°

∴ x = 130

Question 19.

Solution:

The angle ∠BAC is divided by AD in the ratio 1 : 3.

Let ∠BAD and ∠DAC be y and 3y, respectively.

As BAE is a straight line,

∠BAC + ∠CAE = 180° [linear pair]

⇒ ∠BAD + ∠DAC + ∠CAE = 180°

⇒ y + 3y + 108° = 180°

⇒ 4y = 180° – 108° = 72°

⇒ y = 72/4= 18°

Now, in ΔABC,

∠ABC + ∠BCA + ∠BAC = 180°

y + x + 4y = 180°

[Since, ∠ABC = ∠BAD (given AD = DB) and ∠BAC = y + 3y = 4y]

⇒ 5y + x = 180

⇒ 5 × 18 + x = 180

⇒ 90 + x = 180

∴ x = 180 – 90 = 90

Question 20.

Solution:

Given : A ΔABC in which BC, CA and AB are produced to D, E and F respectively.

To prove : Exterior $\angle DCA$ + Exterior $\angle BAE$ + Exterior $\angle FBD = 360^o$

Proof : Exterior $\angle DCA = \angle A + \angle B$ ….(i)

Exterior $\angle FAE = \angle B + \angle C$ ….(ii)

Exterior $\angle FBD = \angle A + \angle C$ ….(iii)

Adding (i), (ii) and (iii), we get,

Ext. $\angle DCA$ + Ext. $\angle FAE$ + Ext. $\angle FBD$

$= \angle A + \angle B + \angle B + \angle C + \angle A + \angle C$

$= 2\angle A + 2\angle B + 2\angle C$

$= 2(\angle A + \angle B + \angle C)$

$= 2 \times 180^o$

[Since, in triangle the sum of all three angle is 180°]

$= 360^o$

Hence, proved.

Question 21.

Solution:

In ΔACE, we have,

$\angle A + \angle C + \angle E = 180^o$ ….(i)

In ΔBDF, we have,

$\angle B + \angle D + \angle F = 180^o$ ….(ii)

Adding both sides of (i) and (ii), we get,

$\angle A + \angle C + \angle E + \angle B + \angle D + \angle F = 180^o + 180^o$

$\Rightarrow \angle A + \angle B + \angle C + \angle D + \angle E + \angle F = 360^o$.

Question 22.

Solution:
Given : In ΔABC, bisectors of $\angle B$ and $\angle C$ meet at O and $\angle A = 70^\circ$
In ΔBOC, we have,

$$\Rightarrow \angle BOC + \frac{1}{2}\angle B + \frac{1}{2}\angle C = 180^\circ$$

$$\Rightarrow \angle BOC = 180^\circ - \frac{1}{2}\angle B - \frac{1}{2}\angle C$$

$$= 180^\circ - \frac{1}{2}(\angle B + \angle C)$$

$$= 180^\circ - \frac{1}{2}\left[180^\circ - \angle A\right]$$

$$\left[\because \angle A + \angle B + \angle C = 180^\circ\right]$$

$$= 180^\circ - \frac{1}{2}\left[180^\circ - 70^\circ\right]$$
$$= 180^\circ - \frac{1}{2} \times 110^\circ$$

$\angle BOC + \angle OBC + \angle OCB = 180^\circ$
$= 180^\circ - 55^\circ = 125^\circ$
$\therefore \angle BOC = 125^\circ$.

Question 23.

Solution:
We have a ΔABC whose sides AB and AC have been procued to D and E. $A = 40^\circ$ and bisectors of $\angle CBD$ and $\angle BCE$ meet at O.
In ΔABC, we have,

Exterior $\angle CBD = C + 40^\circ$

$$\Rightarrow \quad \angle CBO = \frac{1}{2}\text{ Ext. } \angle CBD$$
$$= \frac{1}{2}\left(\angle C + 40^\circ\right)$$
$$= \frac{1}{2}\angle C + 20^\circ$$

And exterior $\angle BCE = B + 40^\circ$

$$\Rightarrow \quad \angle BCO = \frac{1}{2}\text{ Ext. } \angle BCE$$
$$= \frac{1}{2}\left(\angle B + 40^\circ\right)$$
$$= \frac{1}{2}\angle B + 20^\circ.$$

Now, in ΔBCO, we have,

$$\angle BOC = 180^\circ - \angle CBO - \angle BCO$$
$$= 180^\circ - \frac{1}{2}\angle C - 20^\circ - \frac{1}{2}\angle B - 20^\circ$$
$$= 180^\circ - \frac{1}{2}\angle C - \frac{1}{2}\angle B - 20^\circ - 20^\circ$$
$$= 180^\circ - \frac{1}{2}(\angle B + \angle C) - 40^\circ$$
$$= 140^\circ - \frac{1}{2}(\angle B + \angle C)$$
$$= 140^\circ - \frac{1}{2}\left[180^\circ - \angle A\right]$$
$$= 140^\circ - 90^\circ + \frac{1}{2}\angle A$$
$$= 50^\circ + \frac{1}{2}\angle A$$
$$= 50^\circ + \frac{1}{2} \times 40^\circ$$

$= 50^\circ + 20^\circ$

$= 70^\circ$

Thus, $\angle BOC = 70^\circ$

Question 24.

Solution:

In the given ΔABC, we have,

$\angle A : \angle B : \angle C = 3 : 2 : 1$

Let $\angle A = 3x$, $\angle B = 2x$, $\angle C = x$. Then,

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

$\Rightarrow 3x + 2x + x = 180^\circ$

$\Rightarrow 6x = 180^\circ$

$\Rightarrow x = 30^\circ$

$\angle A = 3x = 3\ 30^\circ = 90^\circ$

$\angle B = 2x = 2\ 30^\circ = 60^\circ$

and, $\angle C = x = 30^\circ$

Now, in ΔABC, we have,

Ext $\angle ACE = \angle A + \angle B = 90^\circ + 60^\circ = 150^\circ$

$\angle ACD + \angle ECD = 150^\circ$

$\Rightarrow \angle ECD = 150^\circ - \angle ACD$

$\Rightarrow \angle ECD = 150^\circ - 90^\circ$ [since , $AD \perp CD$, $\angle ACD = 90^\circ$]

$\Rightarrow \angle ECD = 60^\circ$

Question 25:

Solution:

In ΔABC, AN is the bisector of $\angle A$ and $AM \perp BC$.

Now in ΔABC we have;

$\angle A = 180^o - \angle B - \angle C$

$\Rightarrow \angle A = 180^o - 65^o - 30^o$

$= 180^o - 95^o$

$= 85^o$

Now, in ΔANC we have;

Ext. $\angle MNA = \angle NAC + 30^0$

$= \frac{1}{2}\angle A + 30^\circ$

$= \frac{85^\circ}{2} + 30^\circ$

$= \frac{85^\circ + 60^\circ}{2}$

$= \frac{145^\circ}{2}$

Therefore, $\angle MNA = \frac{145^\circ}{2}$

In Δ MAN, we have;

$\angle MAN = 180^0 - \angle AMN - \angle MNA$

$= 180^0 - 90^0 - \angle MNA$ [since $AM \perp BC$, $\angle AMN = 90^\circ$]

$= 90^\circ - \frac{145^\circ}{2}$ [since $\angle MNA = \frac{145^\circ}{2}$]

$= \frac{180^\circ - 145^\circ}{2}$

$= \frac{35^\circ}{2}$

$= 17.5^\circ$

Thus, $\angle MAN = 17.5^0$

Question 26.

Solution:

(i) False : As a triangle has only one right angle

(ii) True : If two angles will be obtuse, then the third angle will not exist.

(iii) False : As an acute angled triangle all the three angles are acute.
(iv) False : As if each angle will be less than 60°, then their sum will be less than 60° x 3 = 180°, which is not true.
(v) True : As the sum of three angles will be 60° x 3 = 180°, which is true.
(vi) True : A triangle can be possible if the sum of its angles is 180°
But the given triangle having angles 10° + 80° + 100° = 190° is not possible.

Benefits of RS Aggarwal Solutions Class 9 Maths Chapter 8 - Triangles

Here are some key benefits of RS Aggarwal Solutions Class 9 Maths Chapter 8:

Clarity of Concepts: The solutions provide clear explanations of the concepts related to triangles, making it easier for students to understand.

Step-by-Step Approach: Each solution is presented in a step-by-step manner, allowing students to follow along and grasp the solution method.

Practice Material: The chapter provides ample practice problems, allowing students to reinforce their understanding of triangle geometry.

Exam Preparation: By solving the problems in this chapter, students can prepare effectively for their exams, including both school exams and competitive exams.

Self-Assessment: The solutions enable students to assess their understanding of the concepts by checking their answers against the provided solutions.