RS Aggarwal Solutions for Class 10 Maths Chapter 4 Exercise 4.4: RS Aggarwal Solutions for Class 10 Maths Chapter 4 Triangles Exercise 4.4 help students understand the basics of triangles. This exercise focuses on how to identify similar triangles, the rules for similarity, and important theorems about triangles.

Each problem is explained in a simple, step-by-step way, making it easy for students to follow and learn. By using these solutions, students can improve their skills in solving triangle problems and get a better grasp of the key concepts in geometry. Practicing these exercises will make students more confident and accurate in their math work.

RS Aggarwal Solutions for Class 10 Maths Chapter 4 Exercise 4.4 Overview

The RS Aggarwal Solutions for Class 10 Maths Chapter 4 Exercise 4.4, prepared by the subject experts of Physics Wallah, help students learn about triangles. This exercise covers the properties of similar triangles, how to identify them, and important theorems.

Each solution is explained in easy steps so students can understand and follow along. These solutions are designed to help students get better at solving triangle problems and understand geometry more clearly. Practicing these exercises will make students more confident and accurate in their math skills.

RS Aggarwal Solutions for Class 10 Maths Chapter 4 Triangles Exercise 4.4 PDF

Here we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 4 Triangles Exercise 4.4 for the ease of students so that they can prepare better for their upcoming exams –

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Below we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 4 Triangles Exercise 4.4 for the ease of the students –

Question 1.

Solution:

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

(i) L.H.S. = $(\text{Hypotenuse})^2 = (18)^2 = 324$

R.H.S. = $(\text{Base})^2 + (\text{Height})^2 = (9)^2 + (16)^2 = 81 + 256 = 337$

⇒L.H.S. ≠ R.H.S.

∴It is not a right triangle.

(ii) L.H.S. = $(\text{Hypotenuse})^2 = (27)^2 = 729$

R.H.S. = $(\text{Base})^2 + (\text{Height})^2 = (7)^2 + (25)^2 = 49 + 625 = 674$

⇒ L.H.S. ≠ R.H.S.

∴It is not a right triangle.

(iii) L.H.S. = $(\text{Hypotenuse})^2 = (5)^2 = 25$

R.H.S. = $(\text{Base})^2 + (\text{Height})^2 = (1.4)^2 + (4.8)^2 = 1.96 + 23.04 = 25$

⇒ L.H.S. = R.H.S.

∴It is a right triangle.

(iv) L.H.S. = $(\text{Hypotenuse})^2 = (4)^2 = 16$

R.H.S. = $(\text{Base})^2 + (\text{Height})^2 = (1.6)^2 + (3.8)^2 = 2.56 + 14.44 = 17$

⇒ L.H.S. ≠ R.H.S.

∴It is not a right triangle.

(v) L.H.S. = $(\text{Hypotenuse})^2 = (a + 1)^2$

R.H.S. = $(\text{Base})^2 + (\text{Height})^2 = (a-1)^2 + (2\sqrt{a})^2 = a^2 + 1 - 2a + 4a$

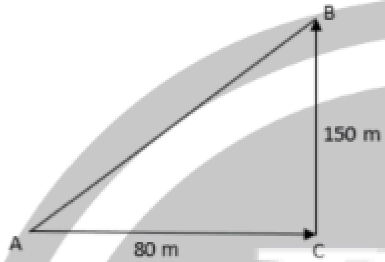
$= a^2 + 1 + 2a = (a + 1)^2$

⇒ L.H.S. = R.H.S.

∴It is a right triangle.

Question 2.

Solution:



The starting point of the man is A and the last point is B so we need to find AB. From the figure, ΔABC is a right triangle.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

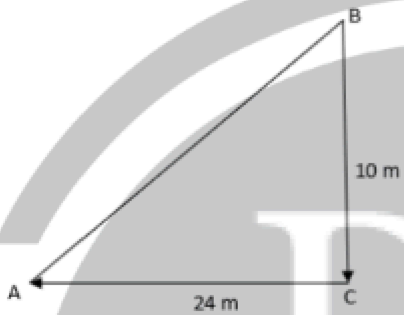
$(AB)^2 = (AC)^2 + (BC)^2$

$\Rightarrow AB^2 = (80)^2 + (150)^2 = 6400 + 22500 = 28900$

$\Rightarrow AB = 170$ m

Question 3.

Solution:



The starting point of the man is B and the last point is A so we need to find AB. From the figure, ΔABC is a right triangle.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

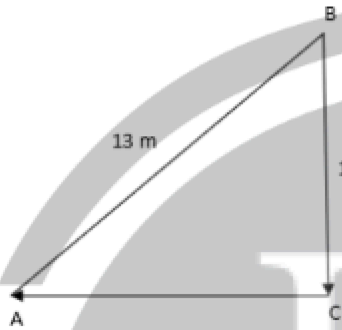
$(AB)^2 = (AC)^2 + (BC)^2$

$\Rightarrow AB^2 = (24)^2 + (10)^2 = 576 + 100 = 676$

$\Rightarrow AB = 26$ m

Question 4 .

Solution:



Ladder AB = 13 m and distance from the window BC = 12 m.

AC is the distance of the ladder from the building.

From the figure, ΔABC is a right triangle.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

$(AB)^2 = (AC)^2 + (BC)^2$

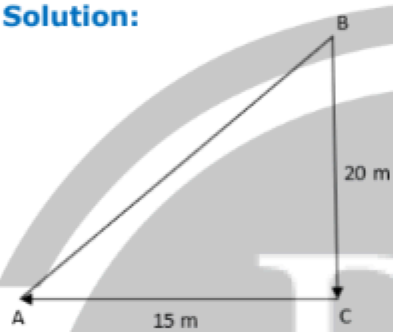
$\Rightarrow 13^2 = (AC)^2 + (12)^2$

$\Rightarrow AC^2 = 169 - 144 = 25$

$\Rightarrow AC = 5$ m

Question 5 .

Solution:



Ladder AB and distance from the window BC = 20 m.

AC is the distance of the ladder from the building = 15 m.

From the figure, ΔABC is a right triangle.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

$(AB)^2 = (AC)^2 + (BC)^2$

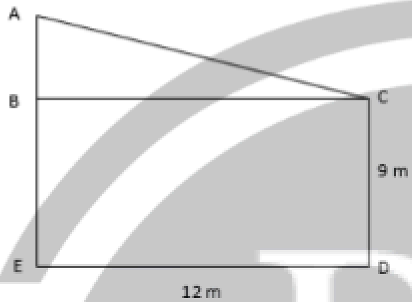
$\Rightarrow AB^2 = (20)^2 + (15)^2$

$\Rightarrow AB^2 = 400 + 225 = 625$

$\Rightarrow AB = 25$ m

Question 6 .

Solution:



AE(height of the first building) = 14 m , CD(height of the second building) = 9 m , ED(distance between their feet) = BC = 12 m

AE – AB = 14 m – 9 m = 5 m

From the figure, ΔABC is a right triangle.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

$(AC)^2 = (AB)^2 + (BC)^2$

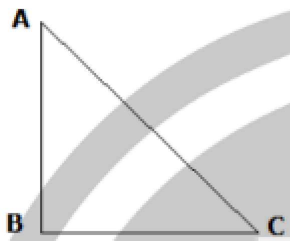
$\Rightarrow AC^2 = (5)^2 + (12)^2$

$\Rightarrow AB^2 = 25 + 144 = 169$

$\Rightarrow AB = 13$ m

Question 7 .

Solution:



Pole AB = 18 m and distance from the window BC.

AC is the length of the wire = 24 m.

From the figure, ΔABC is a right triangle.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

$(AC)^2 = (AB)^2 + (BC)^2$

$\Rightarrow 24^2 = (18)^2 + (BC)^2$

$\Rightarrow BC^2 = 576 - 324 = 252$

$\Rightarrow BC = 6\sqrt{7}$ m

Question 8.

Solution:

ΔPOR is a right triangle because ∠O = 90°.

In a right angled triangle

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

where hypotenuse is the longest side.

$(PR)^2 = (OP)^2 + (OR)^2$

$\Rightarrow PR^2 = (6)^2 + (8)^2$

$\Rightarrow PR^2 = 36 + 64 = 100$

$\Rightarrow PR = 10$ m

Now, $PR^2 + PQ^2 = 10^2 + 24^2 = 100 + 576 = 676$

Also, $QR^2 = 26^2 = 676$

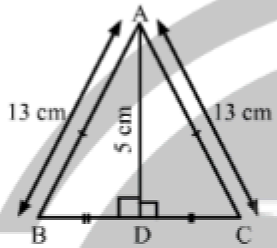
$\Rightarrow PR^2 + PQ^2 = QR^2$

which satisfies Pythagoras theorem.

Hence, ΔPQR is right angled triangle.

Question 9 .

Solution:



Δ ABC is an isosceles triangle.

Also, AB = AC = 13 cm

Suppose the altitude from A on BC meets BC at D. Therefore, D is the midpoint of BC.

AD = 5 cm

ΔADB and ΔADC are right-angled triangles.

Applying Pythagoras theorem,

$AB^2 = BD^2 + AD^2$

$\Rightarrow BD^2 = 13^2 - 5^2$

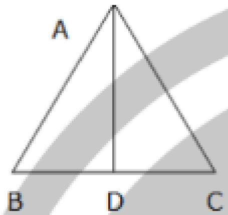
$\Rightarrow BD^2 = 169 - 25 = 144$

$\Rightarrow BD = 12$ cm

So, BC = 2× 12 = 24 cm

Question 10 .

Solution:



Δ ABC is an isosceles triangle.

Also, AB = AC = 2a

The AD is the altitude. Therefore, D is the midpoint of BC.

$BD = \frac{a}{2}$

ΔADB and ΔADC are right-angled triangles.

Applying Pythagoras theorem,

$AB^2 = BD^2 + AD^2$

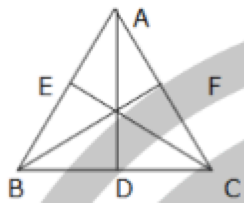
$\Rightarrow (2a)^2 = \frac{a^2}{4} + AD^2$

$\Rightarrow AD^2 = \frac{16a^2 - a^2}{4} = \frac{15a^2}{4}$

$\Rightarrow AD = \frac{a\sqrt{15}}{2}$

Question 11

Solution:



Δ ABC is an equilateral triangle.

Also, BC = AB = AC = 2a

The AD, CE, and BF are the altitude at BC, AB and AC respectively. Therefore, D, E, and F are the midpoint of BC, AB and AC respectively.

Now, ΔADB and ΔADC are right-angled triangles.

Applying Pythagoras theorem,

$AB^2 = BD^2 + AD^2$

$\Rightarrow (2a)^2 = a^2 + AD^2$

$\Rightarrow AD^2 = 3a^2$

$\Rightarrow AD = a\sqrt{3}$ units

Similarly ΔACE and ΔBEC are right-angled triangles.

Applying Pythagoras theorem,

$CE = a\sqrt{3}$ units

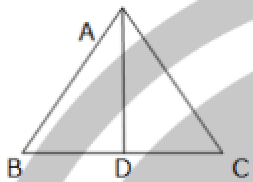
And ΔABF and ΔBFC are right-angled triangles.

Applying Pythagoras theorem,

$BF = a\sqrt{3}$ units

Question 12 .

Solution:



Δ ABC is an equilateral triangle.

Also, BC = AB = AC = 12 cm

The AD is the altitude at BC. Therefore, D is the midpoint of BC.

Now, ΔADB and ΔADC are right-angled triangles.

Applying Pythagoras theorem,

$AB^2 = BD^2 + AD^2$

$\Rightarrow (12)^2 = 6^2 + AD^2$

$\Rightarrow AD^2 = 144 - 36 = 108$

$\Rightarrow AD = 6\sqrt{3}$ cm

Question 13 .

Solution:

Given that AB = 30cm and AD = 16 cm

∵ $\angle A = 90°$

∴ ΔADB is a right-angled triangle.

Applying Pythagoras theorem,

$BD^2 = BA^2 + AD^2$

$\Rightarrow BD^2 = 30^2 + 16^2$

$\Rightarrow BD^2 = 900 + 256 = 1156$

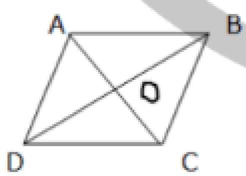
$\Rightarrow BD = 34$ cm

∵ Diagonals of a rectangle are equal

∴ AC = 34 cm

Question 14 .

Solution:



ABCD is a rhombus where AC = 24 cm and BD = 10 cm.

We know that diagonals of a rhombus bisect each other at 90°.

⇒ ∠AOB = 90°, OA = 12 cm and OB = 5 cm

∴ ΔAOB is a right-angled triangle.

Applying Pythagoras theorem,

$BA^2 = BO^2 + AO^2$

$\Rightarrow BA^2 = 5^2 + 12^2$

$\Rightarrow BA^2 = 25 + 144 = 169$

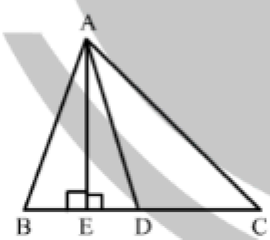
⇒ BA = AD = CD = BC = 13 cm

∵Sides of a rhombus are equal.

Question 15.

Solution:

In right-angled triangle AED, applying Pythagoras theorem,



$AB^2 = AE^2 + BE^2$

$\Rightarrow AE^2 = AB^2 - BE^2$ ....(i)

In right-angled triangle AED, applying Pythagoras theorem,

$AD^2 = AE^2 + ED^2$

$\Rightarrow AE^2 = AD^2 - ED^2$ ....(ii)

Therefore,

$AB^2 - BE^2 = AD^2 - ED^2$

$AB^2 = AD^2 - ED^2 + (\frac{1}{2}BC - DE)^2$

$\Rightarrow AB^2 = AD^2 - ED^2 + \frac{1}{4}BC^2 + DE^2 - BC \times DE$

$\Rightarrow AB^2 = AD^2 + \frac{1}{4}BC^2 - BC \times DE$

Question 16.

Solution:

In ΔACB and ΔCDB,

∠ABC = ∠CBD (Common)

∠ACB = ∠CDB (90°)

So, by AA similarity criterion ΔACB ~ ΔCDB

Similarly, In ΔACB and ΔADC,

∠ABC = ∠ADC (Common)

∠ACB = ∠ADC (90°)

So, by AA similarity criterion ΔACB ~ ΔADC

We know that if two triangles are similar then the ratio of their corresponding sides is equal.

$\Rightarrow \frac{BC}{BD} = \frac{AB}{BC}$ and $\frac{AC}{AD} = \frac{AB}{AC}$

$\Rightarrow BC^2 = AB \times BD$ ....(i)

And $AC^2 = AB \times AD$ .....(ii)

Dividing (i) and (ii), we get

$\frac{BC^2}{AC^2} = \frac{AB \times BD}{AB \times AD} = \frac{BD}{AD}$

Hence, proved.

Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 4 Exercise 4.4

- **Clear Understanding**: The solutions provide step-by-step explanations, helping students understand the concepts of triangles and their properties thoroughly.
- **Expert Guidance**: Prepared by subject experts, these solutions ensure accuracy and adherence to the curriculum, giving students reliable resources for study.

- **Improved Problem-Solving Skills**: By practicing these solutions, students can enhance their ability to solve triangle-related problems efficiently.
- **Confidence Building**: Regular practice with these solutions helps build students confidence in tackling geometry problems and prepares them for exams.
- **Strong Foundation**: The detailed explanations and systematic approach help students build a solid foundation in geometry, which is important for higher-level math studies.