

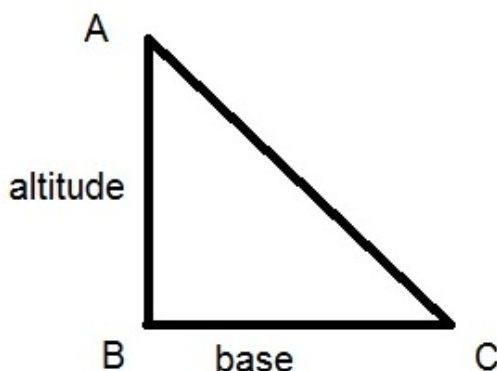
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NCERT Class 9 Solutions: Triangles (Chapter 7) Exercise 7.3 – Part 3

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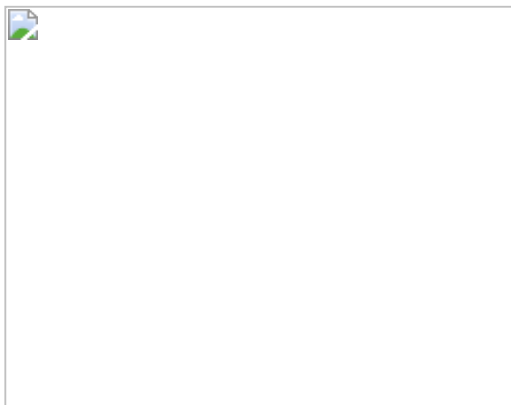
Altitude of triangle



In geometry, an altitude of a triangle is a line segment through a vertex and perpendicular to (i.e., forming a right angle with) a line containing the base (the opposite side of the triangle) . This line containing the opposite side is called the extended base of the altitude.

Q-4 BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles

Solution:

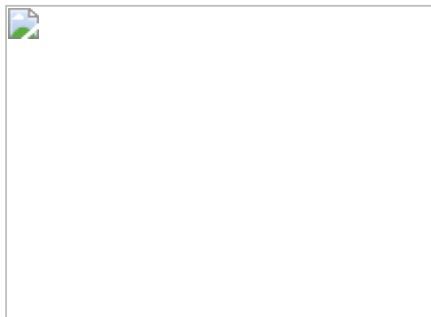


Given, BE and CF are two equal altitudes.

- In $\triangle BEC$ and $\triangle CFB$, $\angle BEC = \angle CFB = 90^\circ$ (Altitudes) $BC = CB$ (Common) $BE = CF$ (Common)
- Therefore, $\triangle BEC \cong \triangle CFB$ by RHS congruence condition.
- Now, $\angle C = \angle B$ (by Corresponding Parts of Congruent Triangles) Thus, $AB = AC$ as sides opposite to the equal angles are equal.

Q-5 ABC is an isosceles triangle with $AB = AC$. Draw $AP \perp BC$ to show that $\angle B = \angle C$.

Solution:



- Given,

$$AB = AC$$

In $\triangle ABP$ and $\triangle ACP$, $\angle APB = \angle APC = 90^\circ$ (AP is altitude) $AB = AC$ (Given) $AP = AP$ (Common line)

- Therefore, $\triangle ABP \cong \triangle ACP$ by Right Angle-Hypotenuse-Side congruence condition.
- Thus, $\angle B = \angle C$ (by Corresponding Parts of Congruent Triangles)