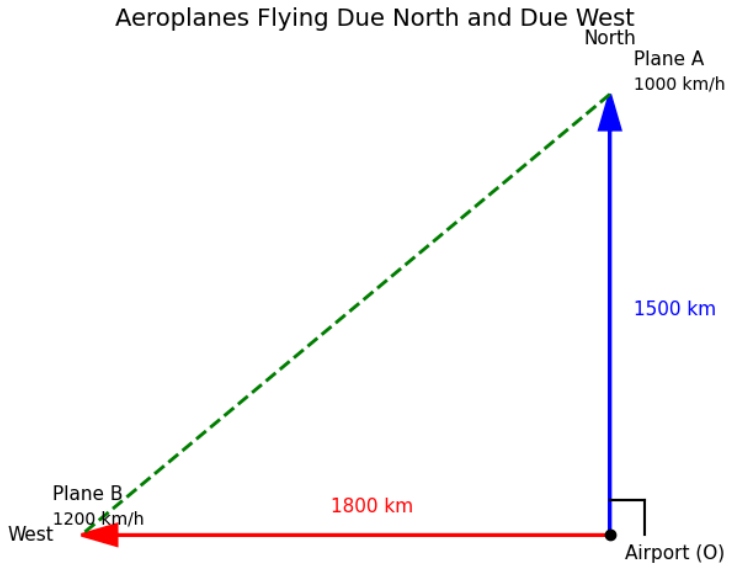
Case Study Questions on Triangles Chapter 6 for Class 10 with Answers

Case Study 1: Two Aeroplanes

An aeroplane leaves an airport and flies due north at a speed of 1000 km/h. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200 km/h. Both planes fly for 1½ hours.



Q1 Distance travelled northward after 1½ hours?

(a) 1000 km

(b) 1200 km

(c) 1500 km

(d) 1800 km

Solution

Distance = Speed × Time = 1000 × 3/2 = 1500 km

Q2 Distance travelled westward after 1½ hours?

(a) 1000 km

(b) 1200 km

(c) 1500 km

(d) 1800 km

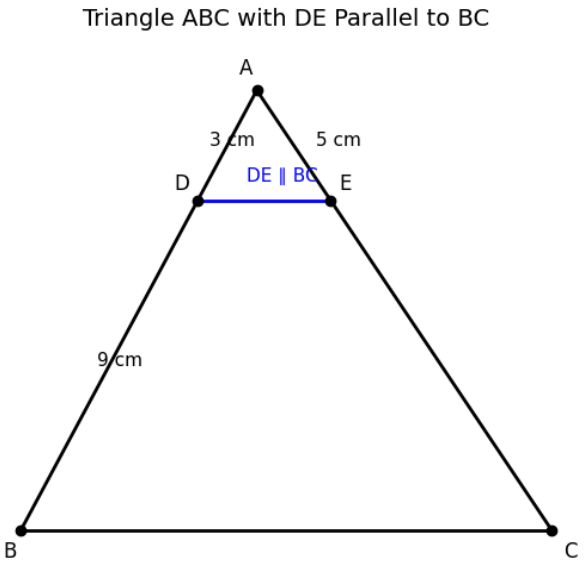
Solution
Distance = Speed × Time = 1200 × 3/2 = 1800 km

Q3 What is ∠AOB?
(a) 90°
(b) 45°
(c) 30°
(d) 60°
Solution
North and West are always perpendicular directions. Therefore ∠AOB = 90°.

Q4 How far apart are the two planes after 1½ hours?
(a) √22,50,000 km
(b) √32,40,000 km
(c) √54,90,000 km
(d) None of these
Solution
By Pythagoras Theorem in △AOB (right-angled at O):
$AB^2 = OA^2 + OB^2 = (1500)^2 + (1800)^2$
= 22,50,000 + 32,40,000 = 54,90,000
AB = √54,90,000 km ≈ 2343 km

Case Study 2: BPT in a Triangle

In triangle ABC, a line DE is drawn parallel to BC, where D lies on AB and E lies on AC. It is given that AD = 3 cm, DB = 9 cm, and AE = 5 cm.
Q1 Find the length of EC.
(a) 9 cm
(b) 12 cm
(c) 15 cm
(d) 18 cm
Solution: Using BPT
Since DE ∥ BC, by BPT: AD/DB = AE/EC
3/9 = 5/EC → EC = 5 × 9/3 = 15 cm



Q2 Find the length of AC.

(a) 15 cm

(b) 18 cm

(c) 20 cm

(d) 25 cm

Solution

AC = AE + EC = 5 + 15 = 20 cm

Q3 State the criterion by which △APQ ~ △ABC (if PQ ∥ BC).

(a) AA Criterion

(b) SAS Criterion

(c) SSS Criterion

(d) RHS Criterion

Solution

∠A is common. Since PQ ∥ BC, ∠APQ = ∠ABC (corresponding angles).

Two angles equal → AA criterion

Q4 If BC = 12 cm, find PQ given AP = 3 cm and AB = 12 cm (AD = 3, DB = 9).

(a) 3 cm

(b) 4 cm

(c) 6 cm

(d) 9 cm

Solution

△APQ ~ △ABC, so PQ/BC = AP/AB

PQ/12 = 3/12 → PQ = 3 cm