DPP – 02
CLASS –10th
TOPIC – BPT

Q.1 In a Δ ABC, D and E are points on the sides AB and AC, respectively, such that DE || BC.

(i) If AD = 6 cm, DB = 9 cm and AE = 8 cm, Find AC.

(ii) If AD/DB = 3/4 and AC = 15 cm, Find AE.

(iii) If AD/DB = 2/3 and AC = 18 cm, Find AE.

(iv) If AD = 4 cm, AE = 8 cm, DB = x – 4 cm and EC = 3x – 19, find x.

(v) If AD = 8 cm, AB = 12 cm and AE = 12 cm, find CE.

(vi) If AD = 4 cm, DB = 4.5 cm and AE = 8 cm, find AC.

(vii) If AD = 2 cm, AB = 6 cm and AC = 9 cm, find AE.

(viii) If AD/BD = 4/5 and EC = 2.5 cm, Find AE.

(ix) If AD = x cm, DB = x – 2 cm, AE = x + 2 cm, and EC = x – 1 cm, find the value of x.

(x) If AD = 8x – 7 cm, DB = 5x – 3 cm, AE = 4x – 3 cm, and EC = (3x–1) cm, Find the value of x.

(xi) If AD = 4x – 3, AE = 8x – 7, BD = 3x – 1, and CE = 5x – 3, find the value of x.

(xii) If AD = 2.5 cm, BD = 3.0 cm, and AE = 3.75 cm, find the length of AC.

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Sol.1 (i) Given: Δ ABC, DE ‖ BC, AD = 6 cm, DB = 9 cm and AE = 8 cm.

Required to find AC.

By using Thales Theorem, [As DE ‖ BC]

AD/BD = AE/CE

Let CE = x.

So then,

6/9 = 8/x

6x = 72 cm

x = 72/6 cm

x = 12 cm

∴ AC = AE + CE = 12 + 8 = 20.

(ii) Given: AD/BD = 3/4 and AC = 15 cm [As DE ‖ BC]

Required to find AE.

By using Thales Theorem, [As DE ‖ BC]

AD/BD = AE/CE

Let, AE = x, then CE = 15-x.

⇒ 3/4 = x/ (15–x)

45 – 3x = 4x

-3x – 4x = – 45

7x = 45

x = 45/7

x = 6.43 cm

∴ AE= 6.43cm

(iii) Given: AD/BD = 2/3 and AC = 18 cm

Required to find AE.

By using Thales Theorem, [As DE ‖ BC]

AD/BD = AE/CE

Let, AE = x and CE = 18 – x

⇒ 2/3 = x/ (18–x)

3x = 36 – 2x

5x = 36 cm

x = 36/5 cm

x = 7.2 cm

∴ AE = 7.2 cm

(iv) Given: AD = 4 cm, AE = 8 cm, DB = x – 4 and EC = 3x – 19

Required to find x.

By using Thales Theorem, [As DE ∥ BC]

AD/BD = AE/CE

Then, 4/ (x – 4) = 8/ (3x – 19)

4(3x – 19) = 8(x – 4)

12x – 76 = 8(x – 4)

12x – 8x = – 32 + 76

4x = 44 cm

x = 11 cm

(v) Given: AD = 8 cm, AB = 12 cm, and AE = 12 cm.

Required to find CE,

By using Thales Theorem, [As DE ∥ BC]

AD/BD = AE/CE

8/4 = 12/CE

8 x CE = 4 x 12 cm

CE = (4 x 12)/8 cm

CE = 48/8 cm

∴ CE = 6 cm

(vi) Given: AD = 4 cm, DB = 4.5 cm, AE = 8 cm

Required to find AC.

By using Thales Theorem, [As DE ∥ BC]

AD/BD = AE/CE

4/4.5 = 8/CE

CE = (4.5 × 8)/4 cm

CE = 9 cm

∴ AC = AE + CE = 8 + 9 = 17 cm

(vii) Given: AD = 2 cm, AB = 6 cm and AC = 9 cm

Required to find AE.

DB = AB – AD = 6 – 2 = 4 cm

By using Thales Theorem, [As DE ∥ BC]

AD/BD = AE/CE

2/4 = x/ (9–x)

4x = 18 – 2x

6x = 18

x = 3 cm

∴ AE= 3cm

(viii) Given: AD/BD = 4/5 and EC = 2.5 cm

Required to find AE.

By using Thales Theorem, [As DE ‖ BC]

AD/BD = AE/CE

Then, 4/5 = AE/2.5

∴ AE = 4 × 2.5/5 = 2 cm

(ix) Given: AD = x, DB = x – 2, AE = x + 2 and EC = x – 1

Required to find the value of x.

By using Thales Theorem, [As DE ‖ BC]

AD/BD = AE/CE

So, x/ (x–2) = (x+2)/ (x–1)

x(x – 1) = (x – 2)(x + 2)

$x^2 – x – x^2 + 4 = 0$

x = 4

(x) Given: AD = 8x – 7, DB = 5x – 3, AER = 4x – 3 and EC = 3x -1

Required to find x.

By using Thales Theorem, [As DE ‖ BC]

AD/BD = AE/CE

(8x–7)/ (5x–3) = (4x–3)/ (3x–1)

(8x – 7)(3x – 1) = (5x – 3)(4x – 3)

$24x^2 – 29x + 7 = 20x^2 – 27x + 9$

$4x^2 – 2x – 2 = 0$

$2(2x^2 – x – 1) = 0$

$2x^2 – x – 1 = 0$

$2x^2 – 2x + x – 1 = 0$

2x(x – 1) + 1(x – 1) = 0

(x – 1)(2x + 1) = 0

⇒ x = 1 or x = -1/2

We know that the side of a triangle can never be negative. Therefore, we take the positive value.

∴ x = 1.

(xi) Given: AD = 4x – 3, BD = 3x – 1, AE = 8x – 7 and EC = 5x – 3

Required to find x.

By using Thales Theorem, [As DE ∥ BC]

AD/BD = AE/CE

So, (4x–3)/ (3x–1) = (8x–7)/ (5x–3)

(4x – 3)(5x – 3) = (3x – 1)(8x – 7)

4x(5x – 3) -3(5x – 3) = 3x(8x – 7) -1(8x – 7)

$20x^2 – 12x – 15x + 9 = 24x^2 – 29x + 7$

$20x^2 -27x + 9 = 24^2 -29x + 7$

$\Rightarrow -4x^2 + 2x + 2 = 0$

$4x^2 – 2x – 2 = 0$

$4x^2 – 4x + 2x – 2 = 0$

4x(x – 1) + 2(x – 1) = 0

(4x + 2)(x – 1) = 0

⇒ x = 1 or x = -2/4

We know that the side of a triangle can never be negative. Therefore, we take the positive value.

∴ x = 1

(xii) Given: AD = 2.5 cm, AE = 3.75 cm and BD = 3 cm

Required to find AC.

By using Thales Theorem, [As DE ∥ BC]

AD/BD = AE/CE

2.5/ 3 = 3.75/ CE

2.5 x CE = 3.75 x 3

CE = 3.75×32.5

CE = 11.252.5

CE = 4.5

Now, AC = 3.75 + 4.5

∴ AC = 8.25 cm.