

8. TRIANGLES

①

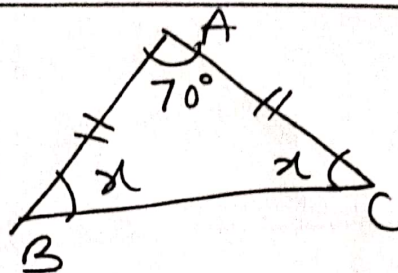
Class: VII. MATHEMATICS

INTEGRATED. SOLUTIONS

2025/26

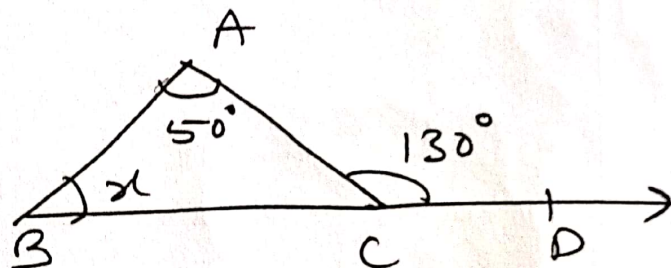
TEACHING TASK
JEE MAINS LEVEL

01. $x + x + 70^\circ = 180^\circ$
 $\Rightarrow x = 55^\circ$



Ans: C

02. $x + 50^\circ = 130^\circ$
 $\Rightarrow x = 80^\circ$



Ans: C

03. one angle $= 60^\circ$
Sum of other two angles $= 180^\circ - 60^\circ = 120^\circ$
 $\therefore \alpha + \beta = 120^\circ, \alpha : \beta = 5 : 7$
 $\alpha = \frac{5}{12} \times 120^\circ = 50^\circ \therefore \beta = 70^\circ$

Ans: A

04 c) $1 : 3 : 6$

$$\alpha = \frac{1}{10} \times 180^\circ = 18^\circ$$

$$\beta = \frac{3}{10} \times 180^\circ = 54^\circ$$

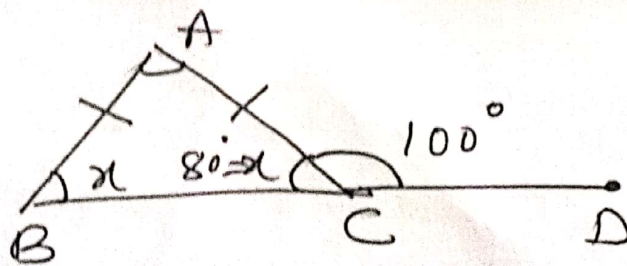
$$\gamma = \frac{6}{10} \times 180^\circ = 108^\circ$$

Ans: C

05

$$80^\circ + 80^\circ + A = 180^\circ$$

$$\Rightarrow A = 20^\circ$$



Ans: A

06

B) 8cm, 9cm, 16cm

$$\text{Since } 8 + 9 > 16$$

$$9 + 16 > 8$$

$$8 + 16 > 9$$

$$9 - 8 < 16$$

$$16 - 9 < 8$$

$$16 - 8 < 9$$

Ans: B

07

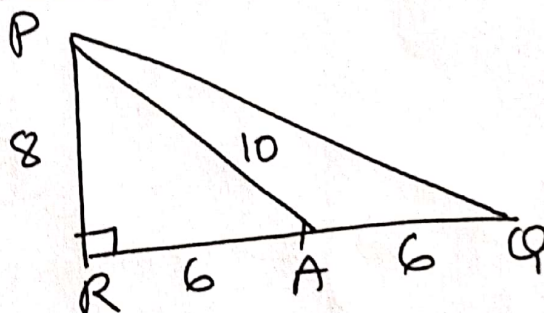
$$\begin{aligned} RA^2 &= PA^2 - PR^2 \\ &= 100 - 64 \\ &= 36 \end{aligned}$$

$$\therefore RA = 6$$

$$\therefore RQ = 12\text{cm}$$

$$PQ^2 = 8^2 + 12^2 = 64 + 144 = 208\text{cm}$$

Ans: B



08

Given $\angle B = 60^\circ$, $\angle C = 45^\circ$

$$\therefore \angle A = 180^\circ - (60^\circ + 45^\circ) = 75^\circ$$

 $\therefore \text{Largest side} = \text{opp. of } \angle A = BC$

Ans: B

09

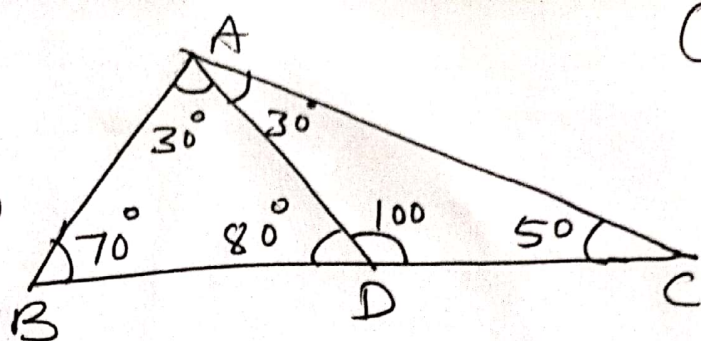
$$\angle A = 50^\circ, \angle B = 70^\circ$$

$$\therefore \angle C = 180^\circ - (50^\circ + 70^\circ) = 60^\circ$$

 $\text{Smallest side} = \text{opp. of } \angle A = BC$

Ans: B

10 Given $\angle B = 70^\circ$
 $\angle C = 50^\circ$
 $\therefore \angle A = 180^\circ - (70^\circ + 50^\circ)$
 $= 60^\circ$



- A) $AB > AD$ (True)
 B) $AD > CD$ (True)

Ans: D

JEE ADVANCED LEVEL

11 Conceptual

Ans: A, B

12 $a + b = 11 \text{ cm} \rightarrow \textcircled{1}$
 $b + c = 13 \text{ cm} \rightarrow \textcircled{2}$
 $c + a = 12 \text{ cm} \rightarrow \textcircled{3}$

$\textcircled{1} + \textcircled{2} + \textcircled{3} \Rightarrow 2(a + b + c) = 36$
 $\Rightarrow a + b + c = 18^\circ \text{ (or)} \frac{36}{2}$

Ans: B, C

13 Statement I: $3^2 + 4^2 = 5^2$ (True)

Statement II: Conceptual (True) Ans: A

14 Statement I: $13^2 + 84^2 = 85^2$ (Right angled triangle) (True)

Statement II: Conceptual (True) ~~Ans: A~~

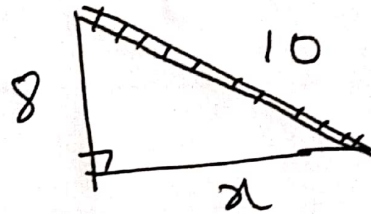
Since, $(m^2 - n^2)^2 + (2mn)^2 = (m^2 + n^2)^2$

Ans: A

15 $\angle ACD = 180^\circ - 105^\circ = 75^\circ$ Answer A (4)

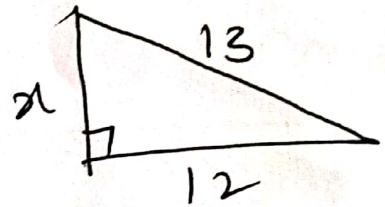
16. Let $\angle CED = x$
We have $x + 46^\circ = 105^\circ$
 $\Rightarrow x = 59^\circ$ Answer B

17. $x^2 + 8^2 = 10^2$
 $\Rightarrow x^2 = 36$
 $\Rightarrow x = 6$



Answer: 6

18 $x^2 + 12^2 = 13^2$
 $\Rightarrow x^2 = 25$
 $\Rightarrow x = 5$



Answer: 5

- 19
- a) $PQ + QR > PR$ (q)
 - b) $|PQ - QR| < PR$ (s)
 - c) $\angle P > \angle Q \Rightarrow QR > PR$ (r)
 - d) $\overline{PQ} > \overline{QR} \Rightarrow \angle R > \angle P$ (p)

Answer: q, s, r, p

- 20
- a) Conceptual (q, r)
 - b) Conceptual (s)
 - c) Conceptual (r)
 - d) Conceptual (p)

Answer: (q, r), s, r, p

LEARNERS TASK (CUES) (5)

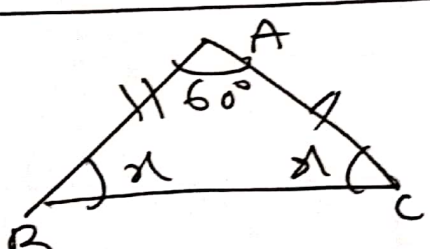
01. Conceptual Ans: B

02. Conceptual Ans: A

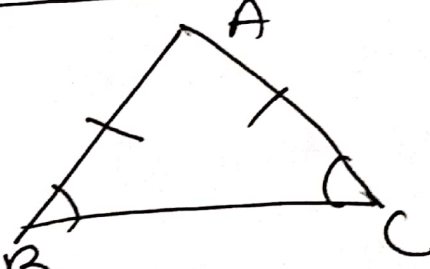
03. Conceptual Ans: B

04. Conceptual Ans: B

05. Conceptual Ans: D

06.  $x + x + 60^\circ = 180^\circ$
 $\Rightarrow x = 60^\circ$ Ans: A

07. Conceptual Ans: B

08.  $\angle B = \angle C \Rightarrow \angle B - \angle C = 0^\circ$ Ans: C

09. Conceptual Ans: A

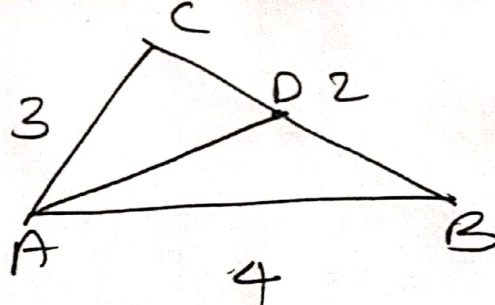
10. Conceptual Ans: B

JEE MAINS LEVEL

01.

01.

⑥



We have $AB^2 + AC^2 = 2(AD^2 + BD^2)$

$$\Rightarrow 4^2 + 3^2 = 2(AD^2 + 1^2)$$

$$\Rightarrow AD^2 = \frac{23}{2}$$

$$\Rightarrow AD = \sqrt{\frac{23}{2}} = \sqrt{\frac{46}{4}} = \frac{\sqrt{46}}{2}$$

Ans: B

02 $LA = LC \Rightarrow BC = AB$

Ans: A

03

$$LA: LB: LC = 7:3:5$$

$\therefore$ Largest Angle = LA

Largest Side = BC

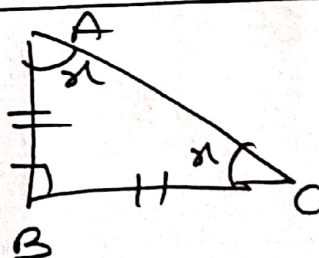
Ans: C

04

$$x + x + 90^\circ = 180^\circ$$

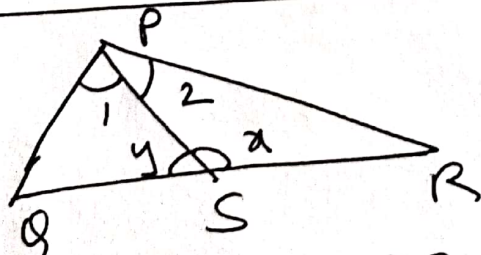
$$x = 45^\circ \quad (\alpha)$$

90°



Ans: C

05



Given $PR > PQ$

$\Rightarrow QR > LR$

$$\Rightarrow 180^\circ - (1 + y) > 180^\circ - (2 + x)$$

$$\Rightarrow -(1 + y) > -(2 + x)$$

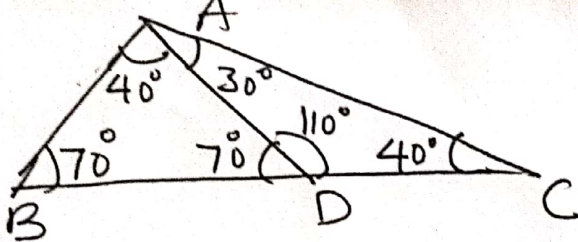
$$\Rightarrow 1 + y < 2 + x$$

$$\Rightarrow Ly < Lx \text{ since } 1 = 2$$

$$\Rightarrow x > y$$

Ans: C

66



- A) $AB > CD$ (True)
 B) $AB = AC$
 $\Rightarrow \angle C = \angle B$
 $\Rightarrow 40^\circ = 70^\circ$ (False)

C) $AC > AB$

$\angle B > \angle C$

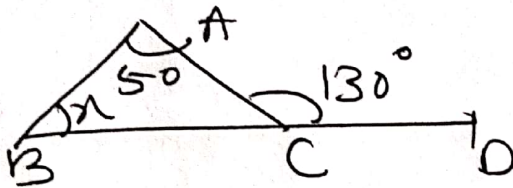
$70^\circ > 40^\circ$ (True)

D) $AC = BC$

$\angle B = \angle A$

$\Rightarrow 70^\circ = 70^\circ$ (True) Ans. B

07



$x + 50^\circ = 130^\circ$
 $\Rightarrow x = 80^\circ$

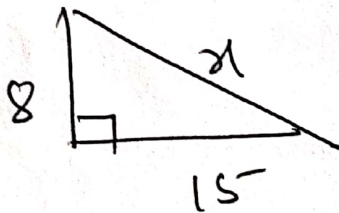
Ans. C

08

$90^\circ = 60^\circ + 30^\circ$

Ans. D

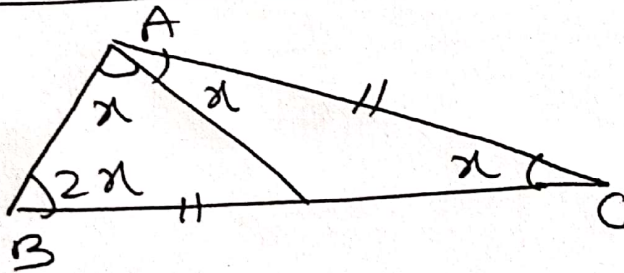
09



$x^2 = 15^2 + 8^2$
 $x = 17$

Ans. C

10



$2x + 2x + x = 180^\circ$
 $\Rightarrow x = 36^\circ$
 $\angle BAC = 2x = 2 \times 36^\circ = 72^\circ$

Ans. B

JEE ADVANCED LEVEL

Ans. A, B, C, D

11. Conceptual

12. Statement I: $30^\circ + 80^\circ + 40^\circ \neq 180^\circ$ (False)

Statement II: Conceptual (True)

Ans. D

13

$$m_a = \frac{1}{2} \sqrt{2b^2 + 2c^2 - a^2}$$

$$5 = \frac{1}{2} \sqrt{2 \times 25 + 2 \times 36 - a^2}$$

$$\Rightarrow 10 = \sqrt{122 - a^2}$$

$$\Rightarrow 100 = 122 - a^2$$

$$\Rightarrow a^2 = 22$$

$$\Rightarrow a = \sqrt{22}$$

Ans. B

14

clearly $PA^2 + OR^2 = PR^2$

$$(6\sqrt{3})^2 + 6^2 = 12^2$$

$$108 + 36 = 144$$

$$\Rightarrow$$

$$\Rightarrow 144 = 144$$

$$\therefore \angle P = 90^\circ$$

Ans: 90°

15

a) $c^2 = 10^2 + 24^2 = 676$
 $\therefore c = 26 (s)$

b) $c^2 = a^2 + b^2$

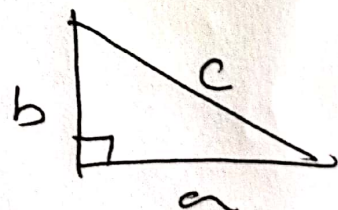
$$\Rightarrow 10^2 = 6^2 + b^2 \Rightarrow b = 8 (p)$$

c) $c^2 = a^2 + b^2$

$$30^2 = a^2 + 18^2 \Rightarrow a = 24 (q)$$

d) $c^2 = a^2 + b^2$

$$\Rightarrow c^2 = 25 + 144 \Rightarrow a = 13 (r)$$



$$c^2 = a^2 + b^2$$

$\Rightarrow$ THE END $\in$

Ans: S, P, Q, R