

FOUNDATION (V₂)

①

Class: 7th : MATHEMATICS

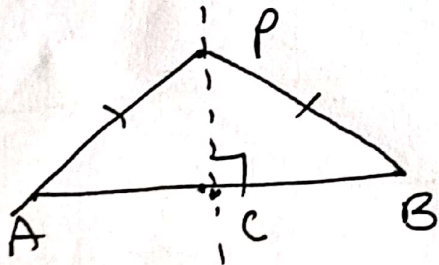
1. CONGRUENCY AND INEQUALITIES ON SIDES OF TRIANGLES

TEACHING TASK JEEMAINS LEVEL

01. $AB = PQ = 5.2 \text{ cm}$
 $BC = QR = 4 \text{ cm}$
 $CA = RP = 3.5 \text{ cm}$
 $\therefore \triangle ABC \cong \triangle PQR$ (By S.S.S) Ans: C

02. $\angle A = 50^\circ, \angle B = 70^\circ \Rightarrow \angle C = 60^\circ$
 $\therefore \angle Q = \angle C = 60^\circ$ Ans: D

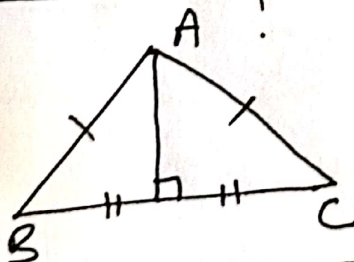
03



$$PA = PB$$
$$\angle APC = \angle BPC$$
$$\angle PAC = \angle PBC$$

Ans: D

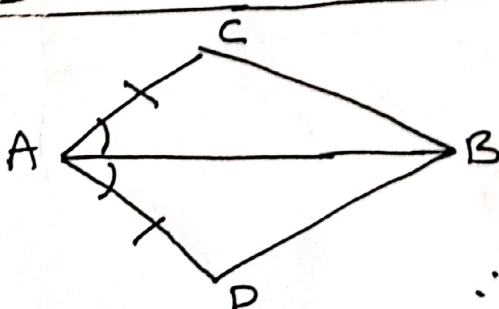
04



Conceptual

Ans: D

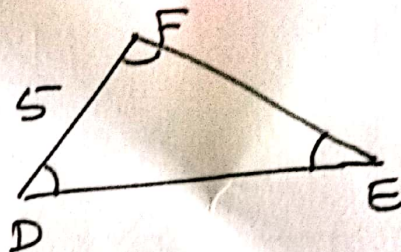
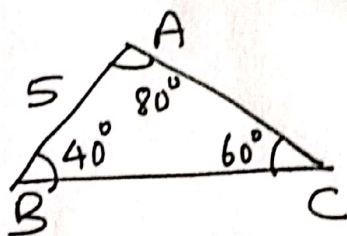
04



$$AC = AD \text{ (given)}$$
$$\angle CAB = \angle BAD \text{ (given)}$$
$$AB = AB \text{ (Common side)}$$
$$\therefore \triangle ABC \cong \triangle ABD \text{ (SAS)}$$
$$BC = BD$$

Ans: D

06

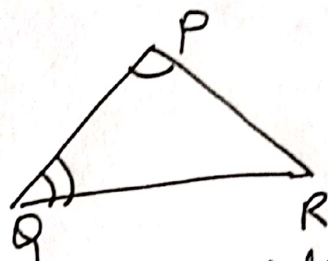
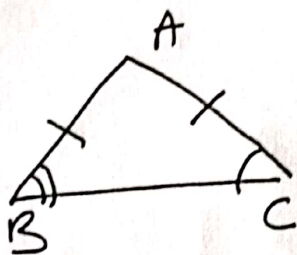


$$\angle E = 60^\circ$$

(2)

Ans: B

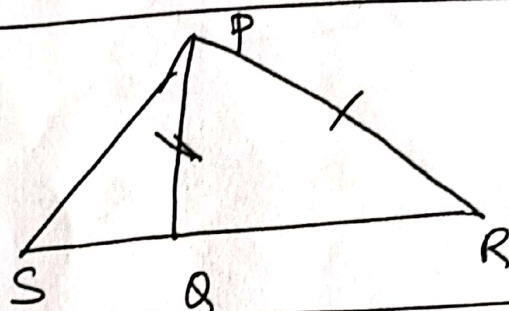
07



Both triangles are isosceles but not congruent

Ans: A

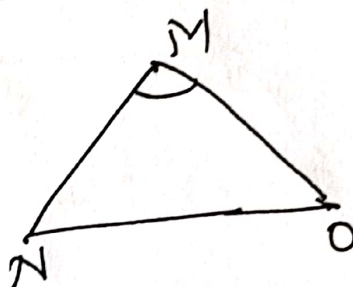
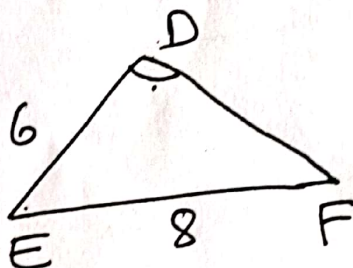
08



$$SP > PQ$$

Ans: D

09



$$MN = DE = 6 \text{ cm}$$

Ans: A

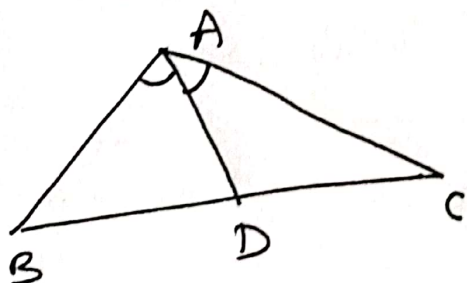
10

Conceptual

Ans: B

JEE ADVANCED LEVEL

11.



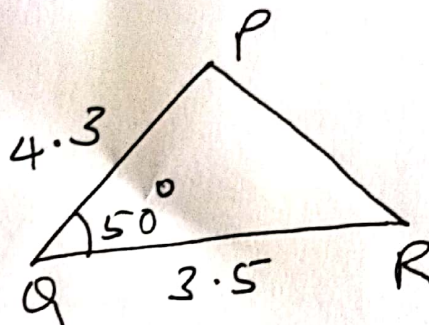
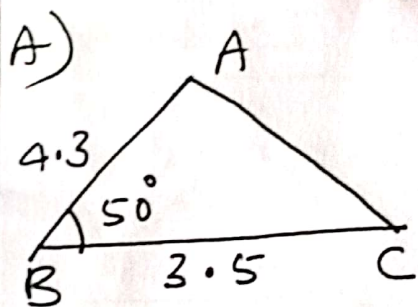
$$A) AB > AD \checkmark$$

$$B) AC > CD \checkmark$$

Ans: A, B

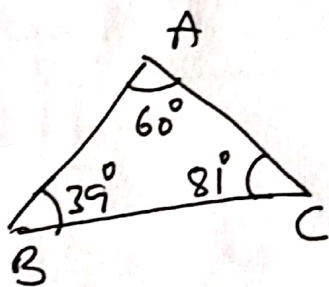
12.

(3)



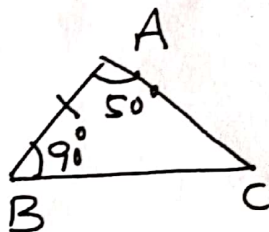
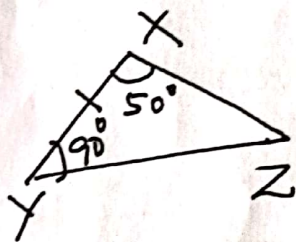
$\therefore \triangle ABC \cong \triangle PQR$ (SAS) ✓

B)



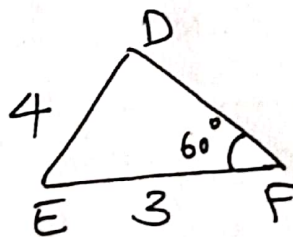
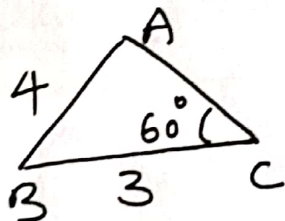
$\therefore \triangle ABC$ is not congruent to $\triangle LMN$

C)



$\triangle XYZ \cong \triangle ABC$ (ASA) ✓

D)



$\triangle ABC \not\cong \triangle DEF$ Not Congruent

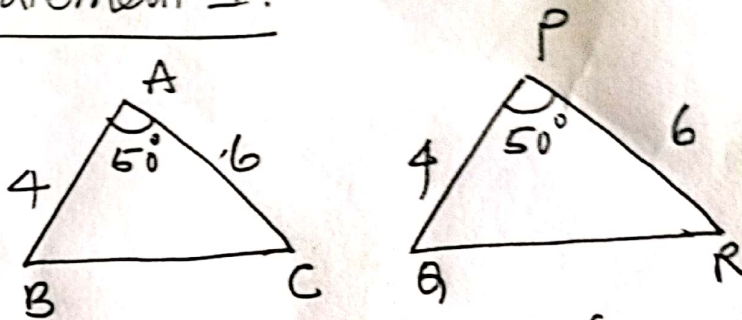
Ans: A, C

13 Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans: A

14 Statement I:

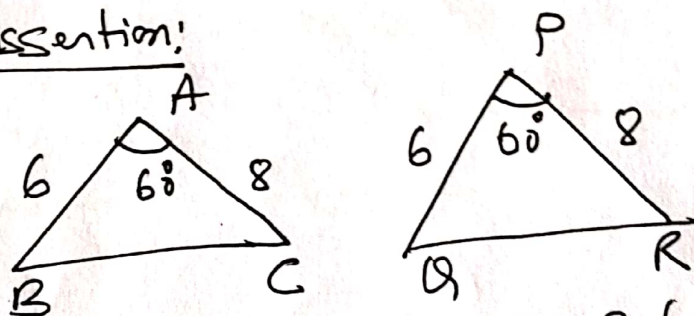


$\triangle ABC \cong \triangle PQR$ (SAS) (True)

Ans: A

Statement II: Conceptual (True)

15 Assertion:



$\triangle ABC \cong \triangle PQR$ (SAS) True

Ans: A

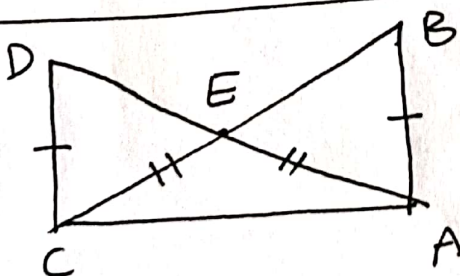
Reason: Conceptual (True)

16 Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

17



In $\triangle ABC$, $\triangle ADC$
 $AB = CD$ (given)
 $AD = CB$ (given)
 $AC = AC$ (Common)

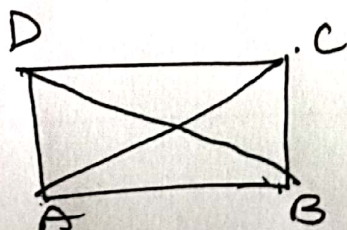
$\therefore \triangle ABC \cong \triangle ADC$ (S.S.S)

Ans:

(OR) $\triangle ADC \cong \triangle CBA$

Ans: D

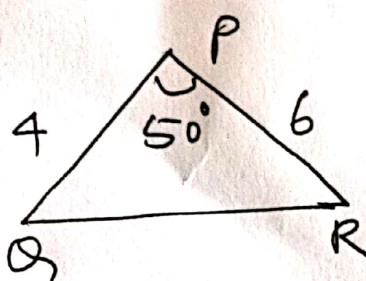
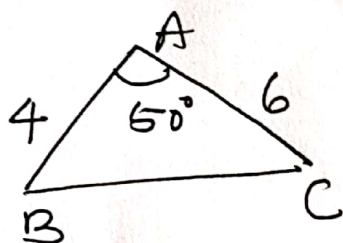
18



$\angle ABC = 90^\circ$

Ans: B

19.



(5)

$$\triangle ABC \cong \triangle PQR$$

Ans: A

20) Since $\triangle ABC \cong \triangle PQR$

Given $AB = 4$, $AC = 6$, $\angle BAC = 50^\circ$

We can determine the length of BC , using the formula, $a^2 = b^2 + c^2 - 2bc \cos A$. Ans: —

21) NOTE: Please, change the question as "length of QR (integral value)".

Given $AB = c = 6$, $AC = b = 8$, $\angle A = 60^\circ$

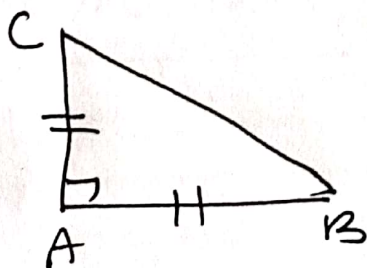
$$\begin{aligned} \text{We have, } BC^2 &= a^2 = b^2 + c^2 - 2bc \cos A \\ &= 64 + 36 - 2 \cdot 6 \cdot 8 \cdot \frac{1}{2} \\ &= 52 \end{aligned}$$

$$\therefore BC = \sqrt{52} = 7 \text{ (approx)}$$

$$\therefore QR = 7$$

Ans: 7

22



$$\begin{aligned} AB &= AC \\ \Rightarrow \angle B &= \angle C = 45^\circ \end{aligned}$$

Ans: 45

- 23 a) S.S.S. (t)
b) R.H.S (P)
c) ASA (r)
d) SAS (q)

Ans: t, p, r, q

- 24 a) SAS (P)
b) SAS (P)
c) SSS (r)
d) RHS (q)

Ans: P, P, r, q

LEARNERS TASK. CUQ'S

01. Conceptual

Ans: A

02 $\triangle ABC \cong \triangle PSR$

Ans: C

NOTE: Assume that sides are also equal

03 $\triangle CBA \cong \triangle RDE$

Ans: A

04 Conceptual

Ans: ~~C~~ D

05 Conceptual

Ans: D

06 Conceptual

Ans: C

07 $AC = PR, \angle CAB = \angle QPR$

Ans: D

08 ASA Congruency

Ans: A

09. SSA

Ans: B

10. ASA

Ans: B

JEEMAINS LEVEL

01. $\triangle PQR \cong \triangle UVW$

$$\Rightarrow \angle P = \angle U, \angle Q = \angle V, \angle R = \angle W$$

$$\text{Also, } PQ = UV, QR = VW, PR = UW$$

Ans: D

02. Conceptual

Ans: A

03. From figure

$$\triangle AOC \cong \triangle BOD, AC = BD, AC \parallel BD$$

(SAS Congruency)

Ans: D

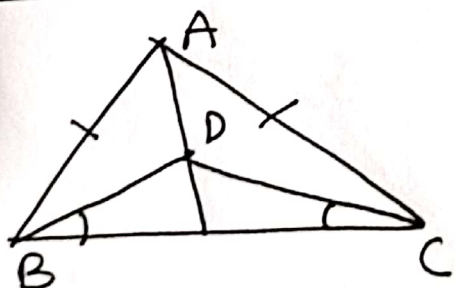
04. SSA $\rightarrow$ It does not guarantee equal sides

Ans: B

05. Conceptual

Ans: D

06.

Given $AB = AC$

$$\Rightarrow \angle ABC = \angle ACB$$

$$\text{Given } \angle BDC = \angle DCB$$

$$\Rightarrow \angle ABD = \angle ACD$$

$$\text{Also, } \angle BAD = \angle CAD$$

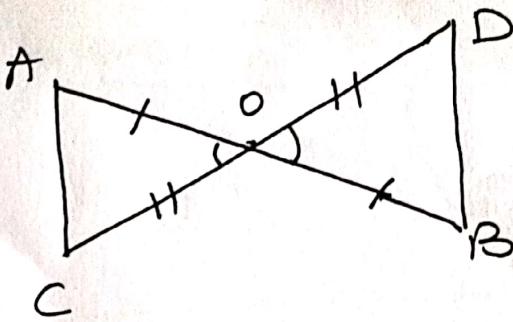
$$\therefore \triangle ABD \cong \triangle ACD \text{ (SAS Congruency)}$$

$$\Rightarrow \angle BAD = \angle CAD$$

$$\Rightarrow AD \text{ bisects } \angle BAC$$

Ans: C

07



$$\therefore \triangle OAC \cong \triangle ODB \text{ (SAS)}$$

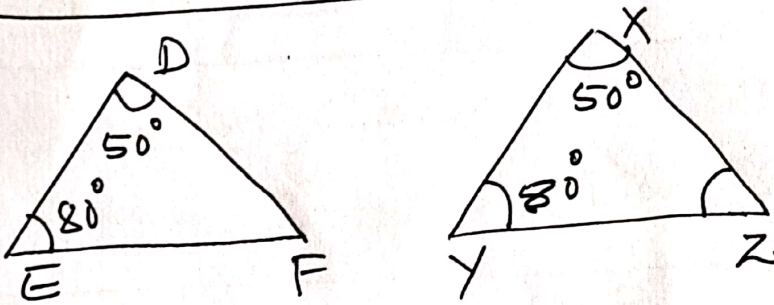
Ans: A

08

Conceptual

Ans: B

09



Given $\triangle DEF \cong \triangle XYZ$
 Clearly $\angle Z = 50^\circ$

Ans: B

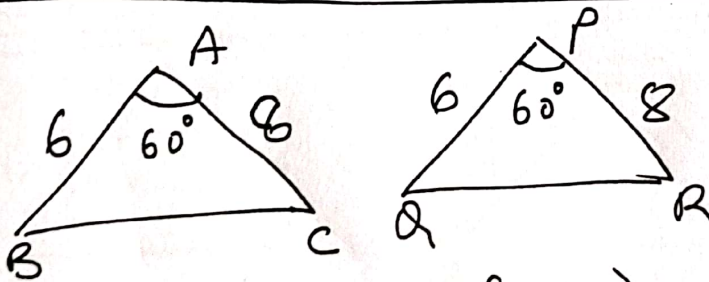
10

Conceptual

Ans: C

JEE ADVANCED

11



$$\triangle ABC \cong \triangle PQR \text{ (SAS)}$$

Ans: A

12

Conceptual

Ans: A

13

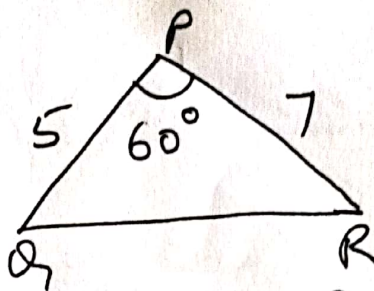
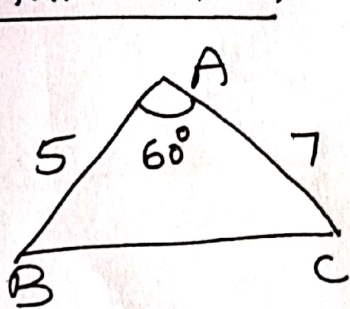
Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans: A

14. Statement I:

9



$$\triangle ABC \cong \triangle PQR \text{ (SAS) (True)}$$

Statement II: Conceptual (True)

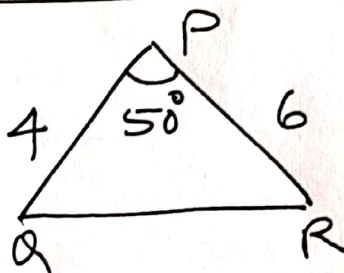
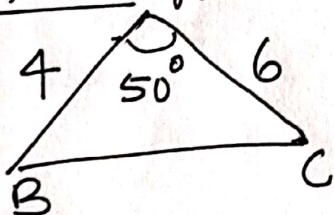
Ans: A

15 Assertion: Conceptual (True) (ASA)

Reason: Conceptual (True) (SAS)

Ans: B

16 Assertion: A

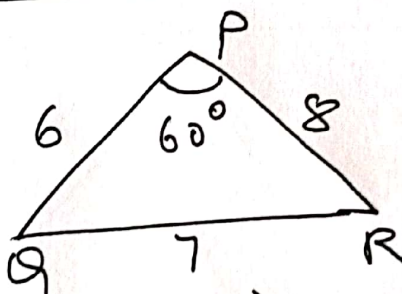
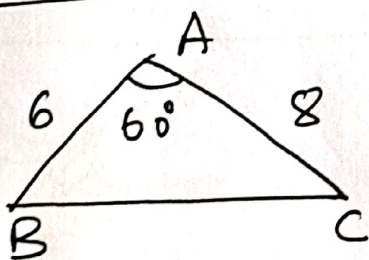


$$\triangle ABC \cong \triangle PQR \text{ (SAS)}$$

Reason: Conceptual (True)

Ans: A

17.



$$\therefore \triangle ABC \cong \triangle PQR \text{ (SAS)}$$

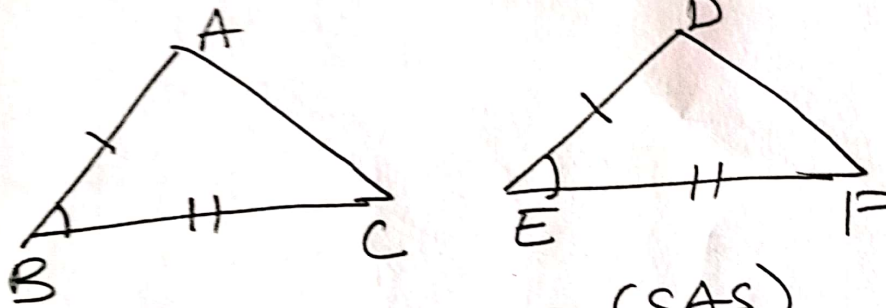
Ans: A

18

$$QR = BC = 7\text{cm}$$

Ans: B

19.



$$\triangle ABC \cong \triangle DEF \text{ (SAS)}$$

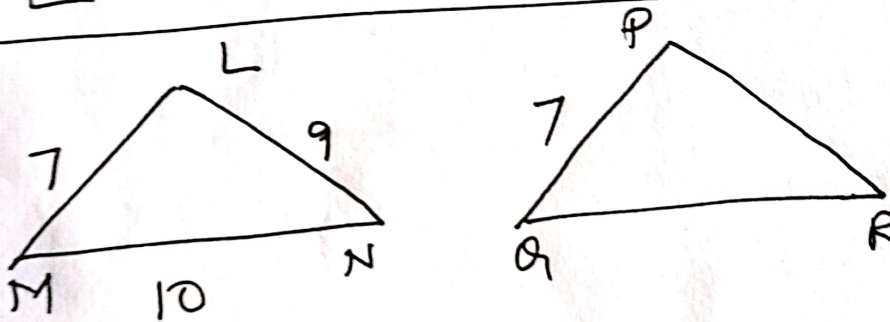
Ans: C

20

$$\angle A = \angle D$$

Ans: B

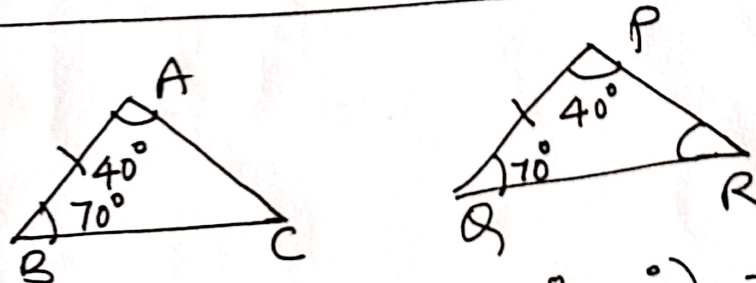
21.



$$\therefore PQ = 7$$

Ans: 7

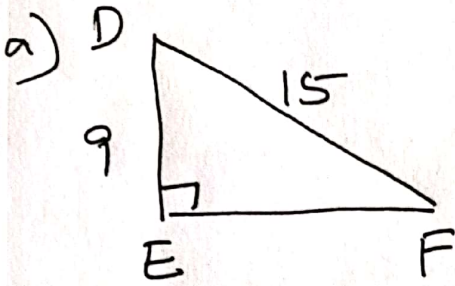
22



$$\therefore \angle R = 180^\circ - (40^\circ + 70^\circ) = 70^\circ$$

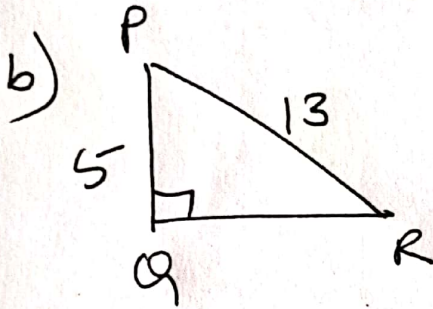
Ans: 70°

23



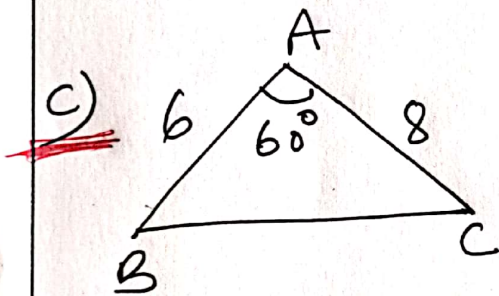
$$\begin{aligned} EF^2 &= 15^2 - 9^2 \\ &= 225 - 81 \\ &= 144 \end{aligned}$$

$$\therefore EF = 12 \text{ (P, D)}$$



$$\begin{aligned} QR^2 &= 13^2 - 5^2 \\ &= 169 - 25 \\ &= 144 \end{aligned}$$

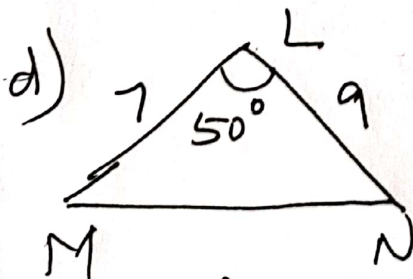
$$\therefore QR = 12 \text{ (P, Q)}$$



$$AB = c = 6, AC = b = 8$$

$$\begin{aligned} \therefore BC^2 = a^2 &= b^2 + c^2 - 2bc \cos A \\ &= 64 + 36 - 2 \cdot 6 \cdot 8 \cdot \frac{1}{2} \\ &= 100 - 48 \\ &= 52 \end{aligned}$$

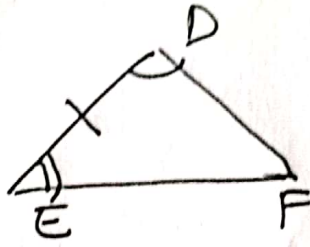
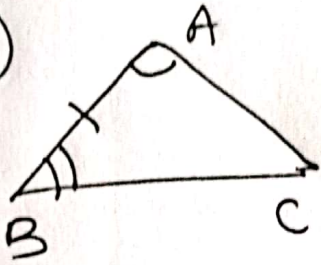
$$\therefore BC = \sqrt{52} = \underline{7.2 \approx 7} \text{ (Approx) (8)}$$



$$\begin{aligned} \therefore MN^2 &= 7^2 + 9^2 - 2 \cdot 7 \cdot 9 \cdot \cos 50^\circ \\ &= \end{aligned}$$

24

a)



$\therefore \triangle ABC \cong \triangle DEF$ (ASA) (✓)

b) SSS (s)

c) RHS (✓)

d) SAS (p)

Ans: ✓, s, ✓, p

$\Rightarrow$ THE END $\Leftarrow$