

# FOUNDATION<sup>+</sup>(V<sub>2</sub>)

①

Class: 7<sup>th</sup> : MATHEMATICS

## 6. CONGRUENCY AND INEQUALITIES ON SIDES OF TRIANGLES

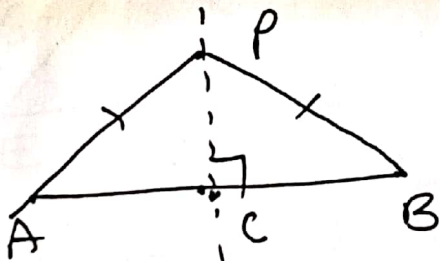
### TEACHING TASK JEEMAINS LEVEL

Q1.  $AB = PQ = 5.2 \text{ cm}$   
 $BC = QR = 4 \text{ cm}$   
 $CA = RP = 3.5 \text{ cm}$   
 $\therefore \triangle ABC \cong \triangle PQR$  (By S.S.S)      Ans: C

Q2 Conceptual

Ans: C

Q3



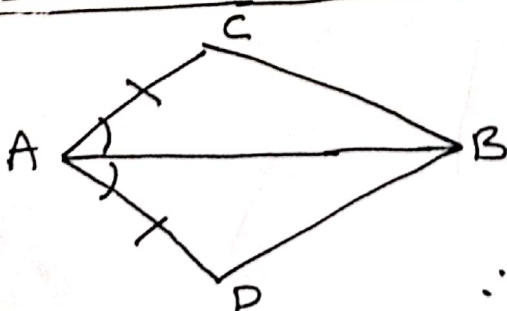
$$PA = PB$$
$$\angle APC = \angle BPC$$
$$\angle PAC = \angle PBC$$

Ans: D

Q5 Conceptual

Ans: B

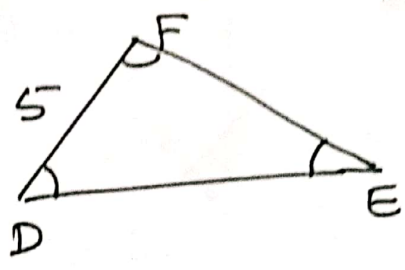
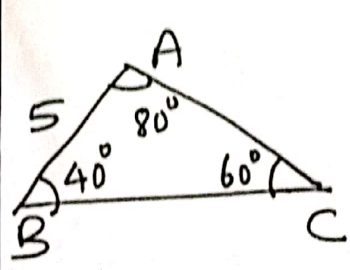
Q4



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

Ans: D

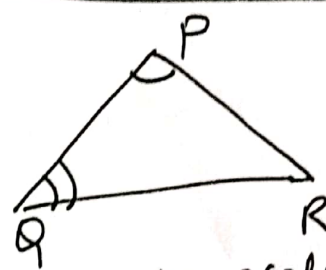
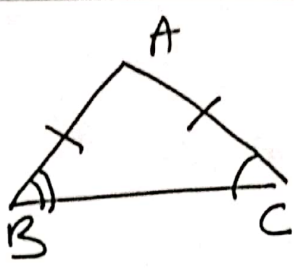
06



$\angle E = 60^\circ$  (2)

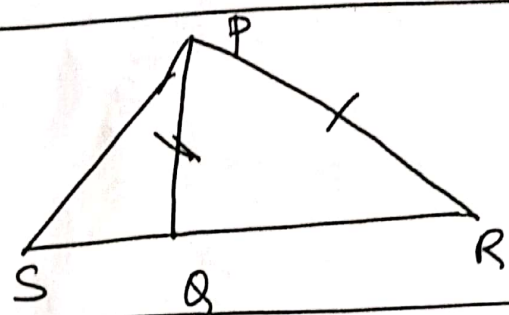
Ans: B

07



Both triangles are isosceles but not congruent  
Ans: A

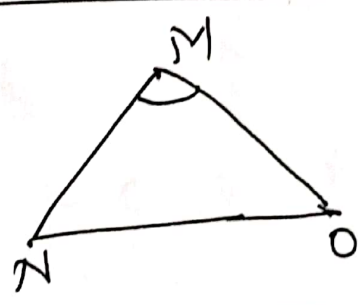
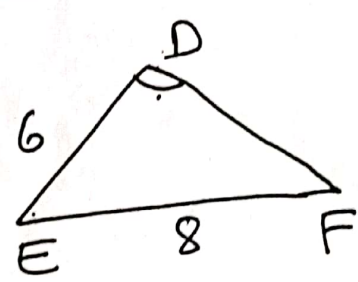
08



$SP > PQ$

Ans: D

09



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

Ans: A

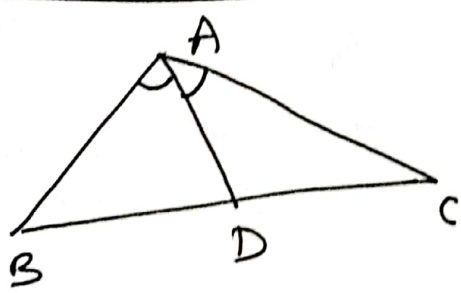
? 10

Conceptual, since BC is largest side  
LA is largest angle

Ans: A

### JEE ADVANCED LEVEL

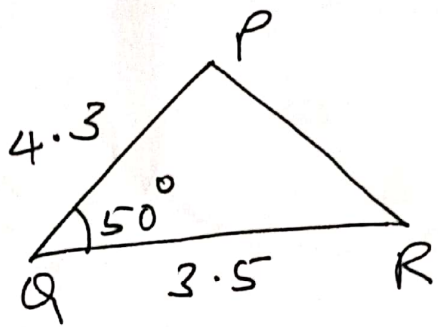
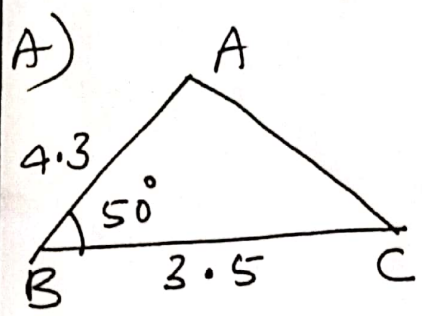
11.



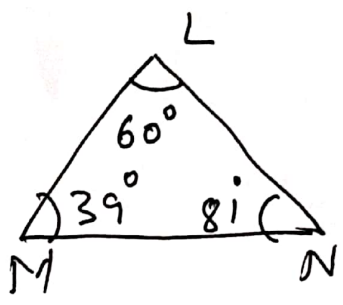
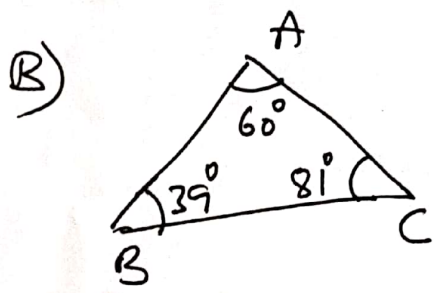
- A)  $AB > AD$  ✓
- B)  $AC > CD$  ✓

Ans: A, B

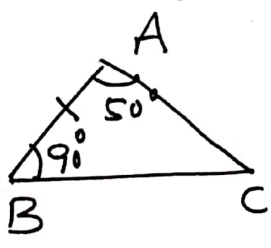
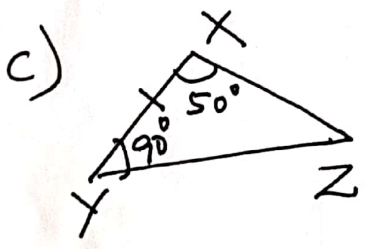
12/



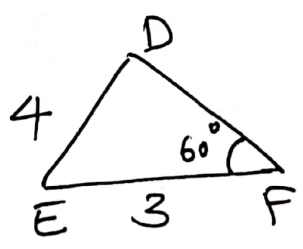
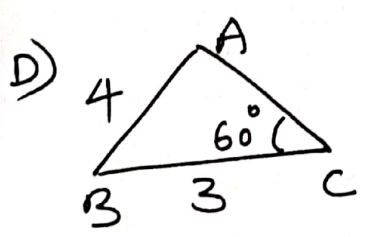
$\therefore \triangle ABC \cong \triangle PQR$  (SAS) ✓



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



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



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

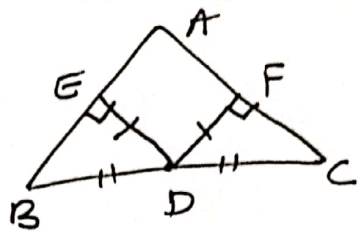
Ans: A, C

13 Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans: A

14 Statement I:



$$\triangle DEF \cong \triangle DFC \text{ (RHS)}$$

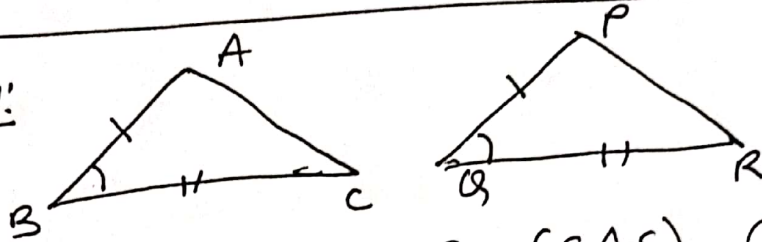
$$\Rightarrow \angle B = \angle C$$

$$\Rightarrow AC = AB \text{ (True)}$$

Statement II: Conceptual (True)

Ans: A

15 Assertion:



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

Reason: Conceptual (True)

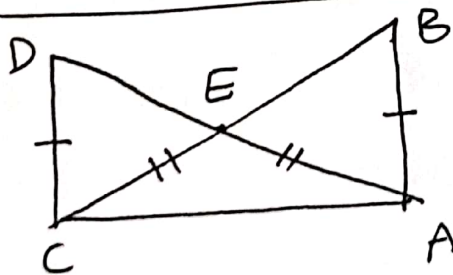
Ans: A

16 Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

17



In  $\triangle ABC$ ,  $\triangle ADC$

$$AB = CD \text{ (given)}$$

$$AD = CB \text{ (given)}$$

$$AC = AC \text{ (Common)}$$

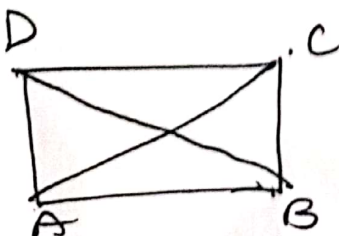
$$\therefore \triangle ABC \cong \triangle ADC \text{ (S.S.S)}$$

$$\text{(OR)} \triangle ADC \cong \triangle CBA$$

Ans:

Ans: D

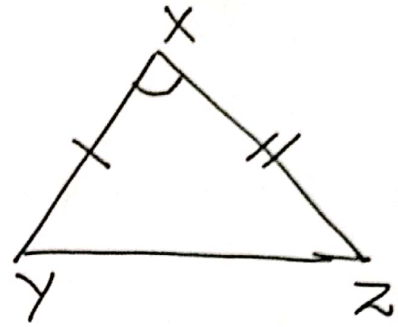
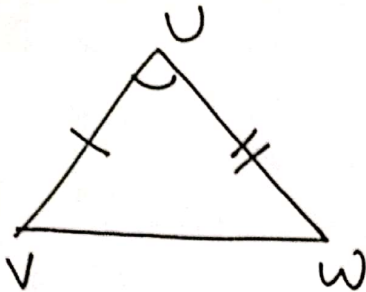
18



$$\angle ABC = 90^\circ$$

Ans: B

19.



(5)

clearly ASA

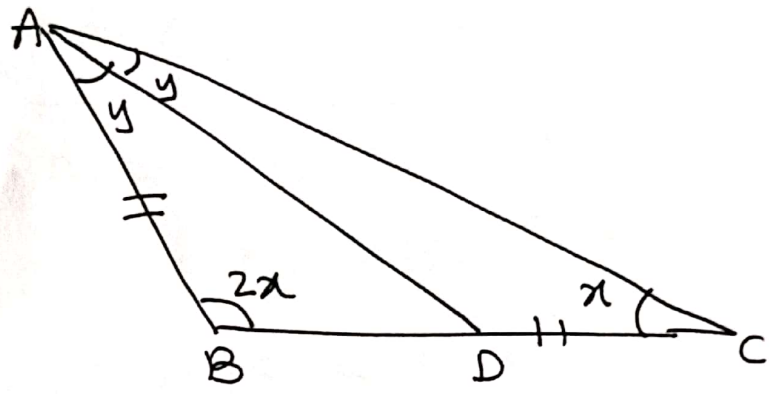
Ans: A

20

$$\angle W = \angle Z$$

Ans: B

21.



$$\text{Let } \angle C = x \Rightarrow \angle B = 2x.$$

$$\text{From figure, } \angle A + \angle B + \angle C = 180^\circ$$

$$\Rightarrow 2\angle y + 2\angle x + \angle x = 180^\circ$$

$$\Rightarrow 2\angle y + 3\angle x = 180^\circ$$

Since, AD is the angle bisector and  $AB = CD$

$$\text{We have } \angle x = \angle y$$

$$\therefore 2\angle y + 3\angle y = 180^\circ$$

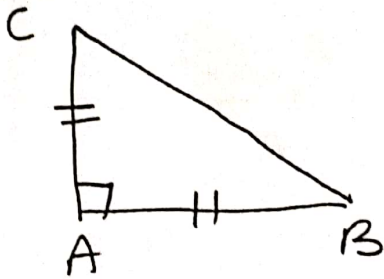
$$\Rightarrow 5\angle y = 180^\circ$$

$$\Rightarrow \angle y = 36^\circ$$

$$\therefore \angle BAC = 2 \times 36^\circ = 72^\circ$$

Ans: 72

2/2



$$AB = AC$$

$$\Rightarrow \angle C = \angle B = 45^\circ$$

(6)

Ans:  $45^\circ$ 

23

a) S.S.S (t)

b) R.H.S (p)

c) A.S.A (r)

d) SAS (q)

Ans: t, r, q

24

a)  $AB + BC > AC$  (s)b)  $DE < DF + EF$  (p)c)  $|PA - QR| < PR$  (q)d)  $YZ > XY + XZ$  (t)

Ans: s, p, q, t

## LEARNERS TASK (COURSES)

01. Conceptual

Ans: A

02  $\triangle ABC \cong \triangle PSR$ 

(NOTE: Assume sides are also equal)

Ans: C

03

 ~~$\triangle ABC \cong \triangle RPS$~~   $AB = CD$ 

Ans: A

04

Conceptual

Ans: D

05

Conceptual

Ans: D

06

Conceptual

Ans: D

07

 $AC = PR \Rightarrow \angle CAB = \angle QPR$ 

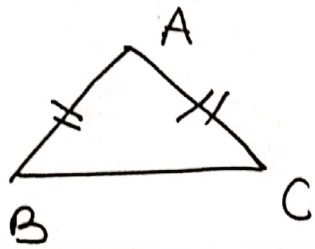
Ans: D

Q.02

~~ASA Congruency~~ Equal

Ans: ~~B~~ <sup>7</sup> A

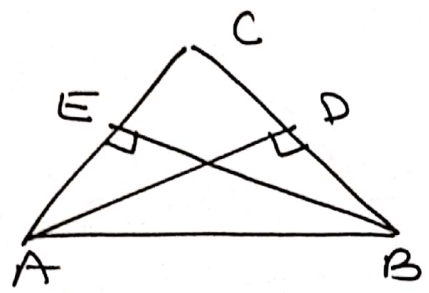
Q.09



$AB = AC$   
 $\Rightarrow \angle C = \angle B$

Ans: C

Q.10



In  $\triangle AEB, \triangle ADB$   
 $\angle AEB = \angle ADB$  (each  $90^\circ$ )  
 $AB = AB$  (Common side)  
 $AE = BD$  (Given)

$\therefore \triangle AEB \cong \triangle ADB$  (RHS)  
 $\Rightarrow AD = BE$

Ans: D

JEE MAINS LEVEL

Q.01

Conceptual

Ans: A

Q.02

Conceptual

$12 + 5 > 6$   
 $XY + YZ > XZ$  ✓

$YZ + XZ > XY$   
 $5 + 6 > 12$  (X)

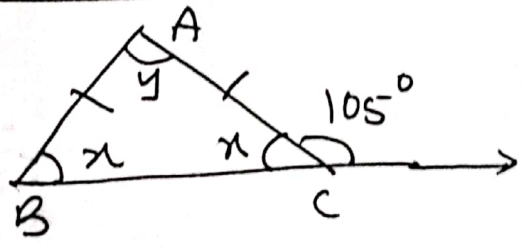
Ans: ~~B~~ A

Q.03

From figure  
 $\triangle AOC \cong \triangle BOD$ ,  $AC = BD$ ,  $AC \parallel BD$   
 (SAS)

Ans: D

Q.04



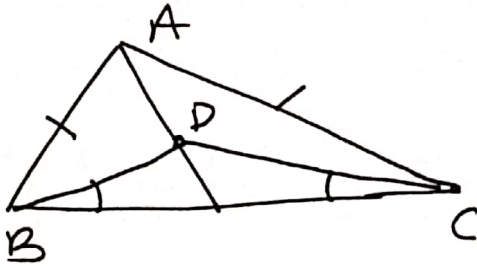
Clearly  $\angle C = 75^\circ$   
 $\therefore 75^\circ + 75^\circ + y = 180^\circ$   
 $\Rightarrow y = 30^\circ$

Ans: B

105 Conceptual

Ans. A (2)

06



Given  $AB = AC$   
 $\Rightarrow \angle ABC = \angle ACB$   
Given  $\angle BDC = \angle DCB$   
 $\Rightarrow BD = CD$   
Also,  $\angle ABD = \angle ACD$

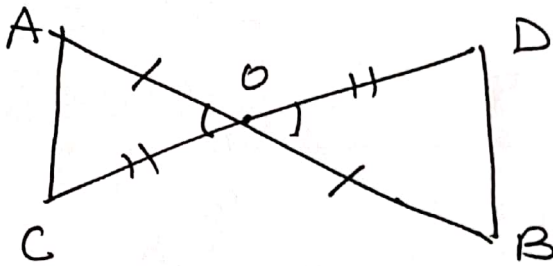
$\therefore \triangle ABD \cong \triangle ACD$  (SAS)

$\Rightarrow \angle BAD = \angle CAD$

$\Rightarrow AD$  bisects  $\angle BAC$

Ans. C

07



$\triangle OAC \cong \triangle ODB$  (SAS)

Ans. A

108 Conceptual

Ans. B

09. Conceptual

Ans. B

10 Conceptual

Ans. C

JEE ADVANCED

11. Conceptual

Ans: B, C

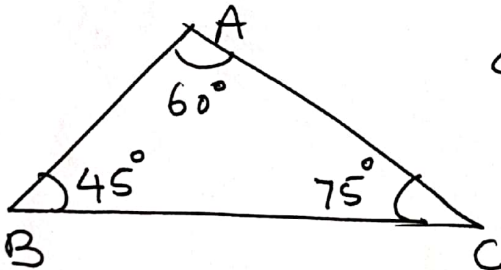
12 conceptual Ans: A (B)

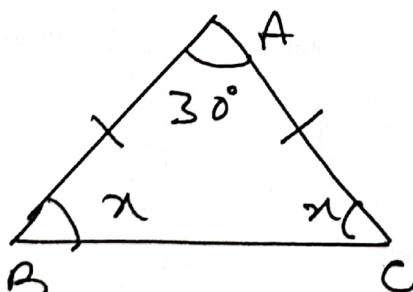
13 statement I: Conceptual (True)  
statement II: Conceptual (True) Ans: A

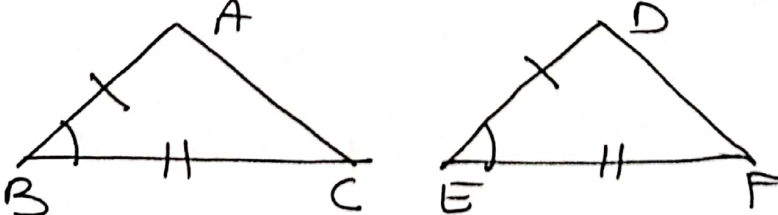
14 statement I: Conceptual (True)  
statement II: Conceptual (True) Ans: A

15 Assertion: ASA Conceptual (True)  
Reason: Conceptual (True) Ans: B

16 Assertion: ASA Conceptual (True)  
Reason: Conceptual (True) Ans: A

17  clearly  $\angle B < \angle A < \angle C$   
 $\Rightarrow AC < BC < AB$   
(or)  $AB > BC > AC$   
Ans: C

18 
$$x + x + 30^\circ = 180^\circ$$
$$\Rightarrow x = 75^\circ$$
$$\therefore \angle B = \angle C, \angle B = \angle C = 75^\circ$$
Ans: D

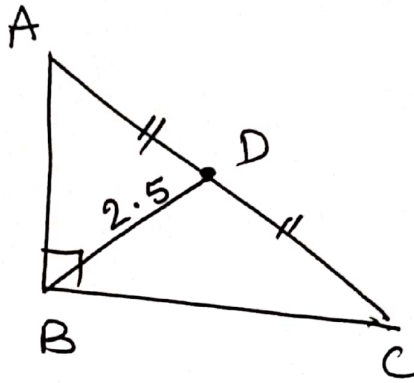
19 
$$\triangle ABC \cong \triangle DEF \text{ (SAS)}$$
Ans: C

20.

$\angle A = \angle D$

Ans. B (10)

21.



$$BD = \frac{1}{2} AC$$

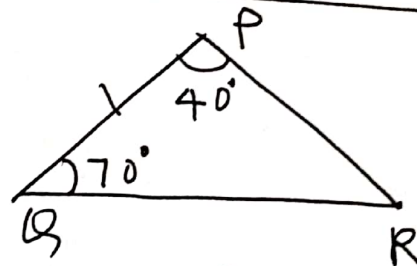
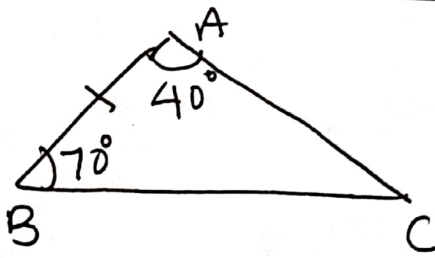
$$\Rightarrow AC = 2 \times BD$$

$$= 2 \times 2.5$$

$$= 5 \text{ cm}$$

Ans: 5

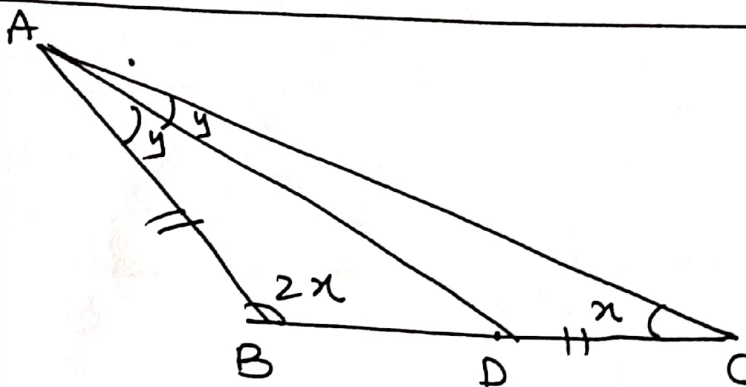
22



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

Ans:  $70^\circ$

23



Let  $\angle C = x \Rightarrow \angle B = 2x$

From figure  $\angle A + \angle B + \angle C = 180^\circ$

$$\Rightarrow 2y + 2x + x = 180^\circ$$

$$\Rightarrow 2y + 3x = 180^\circ \text{ --- (1)}$$

Since, AD is the angle bisector and  $AB = AC$

We have  $x = y$

$$\therefore \text{(1)} \Rightarrow 2y + 3y = 180^\circ \Rightarrow y = 36^\circ$$

$$\text{Also (1)} \Rightarrow 2 \times 36 + 3x = 180^\circ \Rightarrow x = 36^\circ$$

From figure

(11)

$$a) \angle BAC = 2y = 2 \times 36^\circ = 72^\circ (q)$$

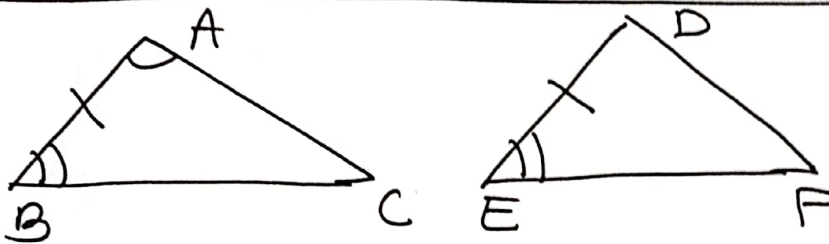
$$b) \angle ABC = 2x = 2 \times 36^\circ = 72^\circ (q)$$

$$c) \angle ADC = 180^\circ - (x + y) \\ = 180^\circ - (36^\circ + 36^\circ) = 180^\circ - 72^\circ \\ = 108^\circ (r)$$

$$d) \angle ADB = 180^\circ - (y + 2x) \\ = 180^\circ - (36^\circ + 2 \times 36^\circ) \\ = 180^\circ - 108^\circ \\ = 72^\circ (q)$$

Ans. q, q, r, q

24



$$a) \triangle ABC \cong \triangle DEF \text{ (ASA) (r)}$$

$$b) \text{SSS (s)}$$

$$c) \text{RHS (q)}$$

$$d) \text{SAS (p)}$$

Ans. r, s, q, p

$\Rightarrow$  THE END  $\in$