CLASS – 7 **SUB-MATHS**

Chapter 7 Congruence of Triangles

Ex. 7.1

Question 1. Complete the following statements:

1. Two line segments are congruent if _____.
2. Among two congruent angles, one has a measure of 70°, the measure of other angle is _____.
3. When we write $\angle A = \angle B$, we actually mean _____.

Answer: (a) they have the same length (b) 70°

(c) $m\angle A = m\angle B$

Question 2. Give any two real time examples for congruent shapes.

Answer: (i) Two footballs

(ii) Two teacher's tables

Question 3. If $\Delta ABC \leftrightarrow \Delta FED$ under the correspondence ABC FED, write all the corresponding congruent parts of the triangles.

(ii) $\angle B$ E

(iii) $\angle C$

$\overline{AB} \leftrightarrow \overline{FE}$D

$\overline{BC}$ (iv) $\overline{ED}$

(v)

$\overline{AC}$ (vi) $\overline{FD}$

Question 4. If $\Delta DEF \quad \Delta BCA$, write the part(s) of ΔBCA that correspond to:

i

$\overline{EF}$.

$\angle$

E

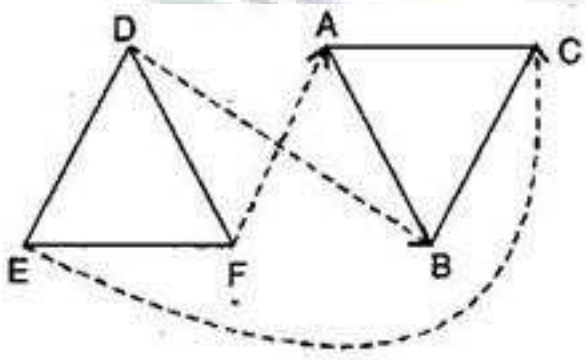
i

i

.

iii. $\angle F$

$\overline{DE}$ iv.



Answer: Given: ΔDEF BCA.

(i) $\angle E$

$\overline{EF} \leftrightarrow \overline{CA}$

↔∠

(ii

(iii) ∠F A

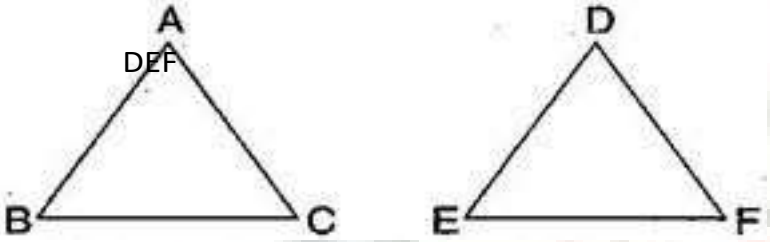
(iv) $\overline{DF}$ ↔ $\overline{BA}$

Ex. 7.2)

Question 1. Which congruence criterion do you use in the following?

(a) Given: AC = DF, AB =

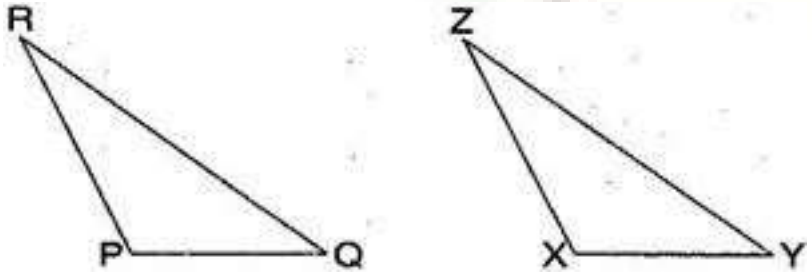
DE, BC = EF So ΔABC Δ



DEF

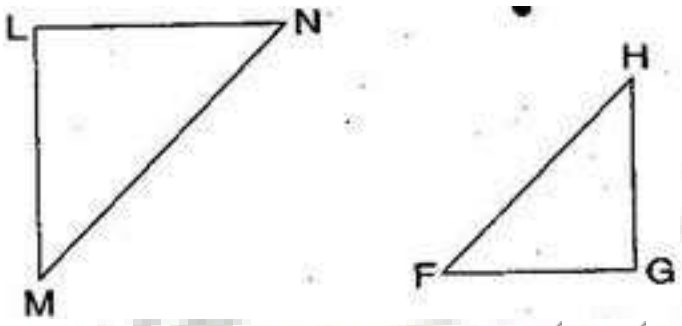
(b) Given: RP = ZX, RQ = ZY, ∠

PRQ = ∠XZY So ΔPQR ΔXYZ

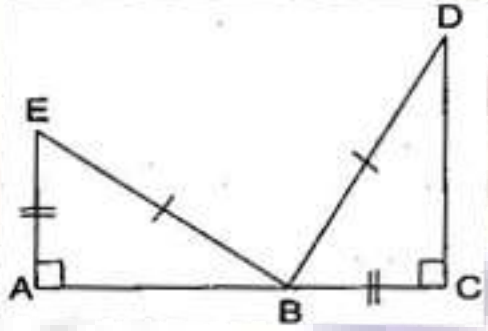


(c) Given: $\angle MLN = \angle FGH$, $\angle NML = \angle HFG$, ML = FG So

$\Delta LMN \quad \Delta GFH$



(d). Given: EB = BD, AE = CB, $\angle A = \angle C = 90^\circ$ So $\Delta ABE \cong \Delta CDB$



Answer: (a) By SSS congruence criterion, since it is given that AC = DF, AB = DE, BC = EF

The three sides of one triangle are equal to the three corresponding sides of another triangle.

Therefore, $\Delta ABC \cong \Delta DEF$

(b) By SAS congruence criterion, since it is given that RP = ZX, RQ = ZY and $\angle PRQ = \angle XZY$

The two sides and one angle in one of the triangle are equal to the corresponding sides and the angle of other triangle.

Therefore, $\Delta PQR \cong \Delta XYZ$

(c) By ASA congruence criterion, since it is given that $\angle MLN = \angle FGH$, $\angle NML = \angle HFG$, ML = FG.

The two angles and one side in one of the triangle are equal to the corresponding angles and side of other triangle.

Therefore, ΔLMN $\cong \Delta$ GFH

(d) By RHS congruence criterion, since it is given that EB = BD, AE = CB, $\angle$A = $\angle$C = 90°

Hypotenuse and one side of a right angled triangle are respectively equal to the hypotenuse and one side of another right angled triangle.

Therefore, $\cong\Delta$ABE CDB

Question 2. You want to show that ΔART ΔPEN:

If you have to use SSS criterion, then you need to show:

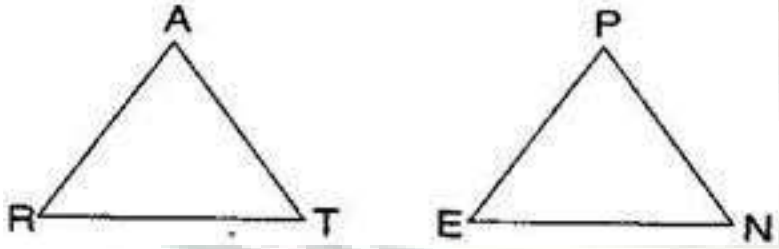
(i) AR = _____ (ii) RT = _____ (iii) AT = _____

If it is given that $\angle$T = $\angle$N and you are to use SAS criterion, you need to have:

(i) RT = and(ii) PN =

If it is given that AT = PN and you are to use ASA criterion, you need to have:

(i) ? (ii) ?



Answer: (a) Using SSS criterion, $\cong\Delta$ART PEN

(i) AR = PE (ii) RT = EN (iii) AT = PN

(b) Given: $\angle$T = $\angle$N

Using SAS criterion, $\cong\Delta$ART PEN

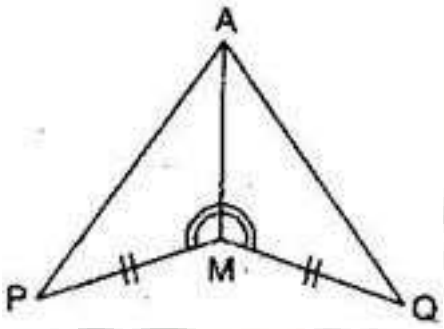
(i) RT = EN (ii) PN = AT

(c) Given: AT = PN

Using ASA criterion, $\cong\Delta$RT PEN

(i) $\angle$RAT = $\angle$EPN (ii) $\angle$RTA = $\angle$ENP

Question 3. You have to show that $\cong\Delta$AMP ΔAMQ. In the following proof, supply the missing reasons:



Steps	Reason
(i) PM = QM	1._____
(ii) ∠PMA = ∠QMA	2. _____
(iii) AM = AM	3. _____
(iv) Δ AMP ≅ Δ AMQ	4. _____

ANSWER:

Steps	Reason
(i) PM = QM	1.Given
(ii) ∠PMA = ∠QMA	2. Given
(iii) AM = AM	3. Common
(iv) Δ AMP ≅ Δ AMQ	4. SAS Congruent rule

Steps	Reasons

CLASS-7 **SUB-MATHS**

CHAPTER - 8

Comparing Quantities

Ex.8.1

Question 1. Find the ratio of:

(a) Rs. 5 to 50 paise

(b) 15 kg to 210 g

(c) 9 m to 27 cm

(d) 30 days to 36 hours

Answer: To find ratios, both quantities should be in same unit.

(a) Rs. 5 to 50 paise

$\Rightarrow$ 5 x 100 paise to 50 paise ∵[Rs. 1 = 100 paise]

$\Rightarrow$ 500 paise to 50 paise

Thus, the ratio is = $\frac{500}{50} = \frac{10}{1}$ = 10 : 1

(b) 15 kg to 210 g

$\Rightarrow$ 15 x 1000 g to 210 g ∵[1 kg = 1000 g]

$\Rightarrow$ 15000 g to 210 g

Thus, the ratio is = $\frac{15000}{210} = \frac{500}{7}$ = 500 : 7

(c) 9 m to 27 cm

$\Rightarrow$ 9 x 100 cm to 27 cm ∵[1 m = 100 cm]

$\Rightarrow$ 900 cm to 27 cm

Thus, the ratio is = $\frac{900}{27} = \frac{100}{3}$ = 100 : 3

(d) 30 days to 36 hours

$\Rightarrow$ 30 x 24 hours to 36 hours ["." 1 day = 24 hours]

$\Rightarrow$ 720 hours to 36 hours

Thus, the ratio is = $\frac{720}{36} = \frac{20}{1}$ = 20 : 1

Question 2. In a computer lab, there are 3 computers for every 6 students. How many computers will be needed for 24 students?

Answer: 6 students needed = 3 computers

Therefore 1 student needs = $\frac{3}{6}$ computers

24 students needs = $\frac{3}{6}$ times 24 = 12 computers

Thus, 12 computers will be needed for 24 students.

Question 3. Population of Rajasthan = 570 lakhs and population of U.P. = 1660 lakhs. Area of Rajasthan = 3 lakh km^2 and area of U.P. = 2 lakh km^2.

(i) How many people are there per km^2 in both states?

(ii) Which state is less populated?

Answer: (i) People present per km^2 = $\frac{\text{Population}}{\text{Area}}$

In Rajasthan = $\frac{570 \text{ lakhs}}{3 \text{ lakhs km}^2}$ = 190 people per km^2

In U.P. = $\frac{1660 \text{ lakhs}}{2 \text{ lakh km}^2}$

= 830 people per km^2

(ii) Rajasthan is less populated.

Ex. 8.2)

Question 1. Convert the given fractional numbers to percent:

(a) $\frac{1}{8}$

(b) $\frac{5}{4}$

(c) $\frac{3}{40}$

(d) $\frac{2}{7}$

Answer: (a) $\frac{1}{8} = \frac{1}{8} \times 100\% = \frac{25}{2}\%$ = 12.5%

(b) $\frac{5}{4} = \frac{5}{4} \times 100\% =$ 5 x 25% = 125%

(c) $\frac{3}{40}$ $\frac{3}{40} \times 100\%$ $\frac{3}{2} \times 5\% = \frac{15}{2}\%$

(d) $\frac{2}{7} = \frac{2}{7} \times 100\% = \frac{200}{7}\% = 28\frac{4}{7}\%$

Question 2. Convert the given decimal fractions to percents:

(a) 0.65 (b) 2.1 (c)0.02 (d) 12.35

Answer: (a) 0.65 = $\times 100\%$ = 65%

(b) 2.1= $\frac{21}{10} \times 100\%$ $\frac{65}{100}$ = 210%

(c) 0.02 = $\frac{2}{100} \times 100\%$ = 2%

(d) 12.35 = $\frac{1235}{100} \times 100\%$ = 1235%

Question 3. Estimate what part of the figures is coloured and hence find the percent which is coloured:

(i) (ii) (iii)

Answer: (i) Coloured part = $\frac{1}{4}$

∴ Percent of coloured part = $\frac{1}{4} \times 100\%$ = 25%

(ii) Coloured part $= \frac{3}{5}$

$\therefore$ Percent of colouredpart $= \frac{3}{5} \times 100\% = 60\%$

(iii) Coloured part $= \frac{3}{8}$

$\therefore$ Percent of colouredpart $= \frac{3}{8} \times 100\% \quad \frac{3}{2} \times 25\%$

$= 37.5\%$

Question 4. Find: (a) 15% of 250

(b) 1% of 1 hour

(c) 20% of Rs. 2500

(d) 75% of 1 kg

Answer: (a) 15% of250 $= \frac{15}{100} \times 250 = 15 \times 2.5 = 37.5$

(b) 1% of 1 hours = 1% of 60 minutes = 1% of (60 x 60) seconds

$= \frac{1}{100} \times 60 \times 60 = 6 \times 6 = 36$ seconds

(c) 20% of Rs. 2500 $= \frac{20}{100} \times 2500 = 20 \times 25 = \text{Rs. } 500$

(d) 75% of 1 kg = 75% of 1000 g $= \frac{75}{100} \times 1000 = 750 \text{ g} = 0.750 \text{ kg}$

Question 5. Find the whole quantity if:

(a) 5% of it is 600

(b) 12% of it is Rs. 1080

(c) 40% of it is 500 km

(d) 70% of it is 14 minutes

(e) 8% of it is 40 liters

Answer: Let the whole quantity be x in given questions:

(a) 5% of x x = 600

$\Rightarrow \frac{5}{100} \times x = 600$

$\Rightarrow x = \frac{600 \times 100}{5}$ = 12,000

(b) 12% of x = Rs. 1080

$\Rightarrow \frac{12}{100} \times x = 1080$

$\Rightarrow x = \frac{1080 \times 100}{12}$ = Rs. 9,000

(c) 40% of x = 500 km

$\Rightarrow \frac{40}{100} \times x = 500$

$\Rightarrow x = \frac{500 \times 100}{40}$ = 1,250 km

(d) 70% of x = 14 minutes

$\Rightarrow \frac{70}{100} \times x = 14$

$\Rightarrow x = \frac{14 \times 100}{70}$ = 20 minutes

(e) 8% of x = 40 liters

$\Rightarrow \frac{8}{100} \times x = 40$

$\Rightarrow x = \frac{40 \times 100}{8}$ = 500 liters

Question 6. Convert given percents to decimal fractions and also to fractions in simplest forms:

(a) 25% (b) 150% (c) 20% (d) 5%

Answer:

S. No.	Percents	Fractions	Simplest form	Decimal form
(a) (b)	25%	$\frac{25}{100}$	$\frac{1}{4}$	0.25
(c)	150%	$\frac{150}{100}$	$\frac{3}{2}$	1.5
(d)	20%	$\frac{20}{100}$	$\frac{1}{5}$	0.2
		$\frac{5}{100}$	$\frac{1}{20}$	

Question 7. In a city, 30% are females, 40% are males and remaining are children. What percent are children?

Answer: Given: Percentage of females = 30% Percentage

of males = 40%

Total percentage of females and males = 30 + 40 = 70%

Percentage of children = Total percentage – Percentage of males and females

= 100% – 70%

= 30%

Hence, 30% are children.

Question 8. Out of 15,000 voters in a constituency, 60% voted. Find the percentage of voters who did not vote. Can you now find how many actually did not vote?

Answer: Total voters = 15,000

Percentage of voted candidates = 60%

Percentage of not voted candidates = 100% – 60% = 40%

Actual candidates, who did not vote = 40% of 15000 = $\frac{40}{100} \times 15000$

= 6,000 Hence, 6,000 candidates did not vote.

Question 9. Meeta saves Rs. 400 from her salary. If this is 10% of her salary. What is her salary?

Answer: Let Meera's salary be Rs. x.

Now, 10% of salary = Rs. 400

$\Rightarrow$ 10% of x = Rs. 400

$\Rightarrow \frac{10}{100} \times x = 400$

$\Rightarrow x = \frac{400 \times 100}{10}$

$\Rightarrow x =$ = 4,000

Hence, Meera's salary is Rs. 4,000.

Question 10. A local cricket team played 20 matches in one season. It won 25% of them. How many matches did they win?

Answer: Number of matches played by cricket team = 20

Percentage of won matches = 25%

Total matches won by them = 25% of 20 = $\frac{25}{100} \times 20$

= 5 Hence, they won 5 matches.