

$$m\angle A = 50^\circ, \quad m\angle P = 50^\circ$$

$$m\angle B = 45^\circ, \quad m\angle Q = 45^\circ$$

$$m\angle C = 85^\circ, \quad m\angle R = 85^\circ$$

$$\frac{m\overline{AC}}{m\overline{PR}} = \frac{4}{2} = \frac{2}{1}$$

$$\frac{m\overline{AB}}{m\overline{PQ}} = \frac{6}{3} = \frac{2}{1}$$

$$\frac{m\overline{BC}}{m\overline{QR}} = \frac{4.6}{2.3} = \frac{2}{1}$$

Exercise 1

Tell Whether or not the Figures in Question 1-3 are Similar:

- | | | |
|----|-----------------------|-----|
| 1. | All squares; | Yes |
| | all rectangles; | No |
| | all regular hexagons. | Yes |

2. Two rectangles with sides 8, 12, 10 and 15.

Ans. These are similar figures

$$\frac{10}{15} = \frac{8}{12}$$

$$\frac{2}{3} = \frac{2}{3}$$

3. Two rhombuses with angles of 55° and 125° .

Ans. These are similar figures because the four.

4. The sides of a polygon are 5cm, 6cm, 7cm, 8cm, and 9cm. In a similar polygon the sides corresponding to 6cm is 12cm. Find the other sides of the second polygon.

Ans. According to the given condition the ratio among

corresponding sides is $\frac{6}{12} = \frac{1}{2}$.

$$\frac{6}{12} = \frac{1}{2} = \frac{7}{a} = \frac{8}{b} = \frac{5}{c} = \frac{4}{d} = \frac{9}{e}$$

$$\frac{7}{a} = \frac{1}{2} \Rightarrow a = 7 \times 2 = 14 \text{ cm}$$

$$\frac{8}{b} = \frac{1}{2} \Rightarrow b = 8 \times 2 = 16 \text{ cm}$$

$$\frac{5}{c} = \frac{1}{2} \Rightarrow c = 5 \times 2 = 10 \text{ cm}$$

$$\frac{4}{d} = \frac{1}{2} \Rightarrow d = 4 \times 2 = 8 \text{ cm}$$

$$\frac{9}{e} = \frac{1}{2} \Rightarrow e = 9 \times 2 = 18 \text{ cm}$$

5. The sides of a quadrilateral are 2cm, 4cm, 6cm, and 7cm. The longest side of a similar quadrilateral is 21cm. Find the other sides.

Ans. The longest side of quadrilateral is 7cm. Thus, the ratio between the biggest sides $\frac{7}{21} = \frac{1}{3}$.

According to the statement the ratio between the corresponding sides is $\frac{1}{3}$.

$$\frac{1}{3} = \frac{6}{a} = \frac{5}{b} = \frac{4}{c} = \frac{2}{d}$$

Thus

$$\frac{6}{a} = \frac{1}{3} \Rightarrow a = 6 \times 3 = 18 \text{ cm} \quad \text{therefore}$$

$$\frac{5}{b} = \frac{1}{3} \Rightarrow b = 5 \times 3 = 15 \text{ cm}$$

$$\frac{4}{c} = \frac{1}{3} \Rightarrow c = 4 \times 3 = 12 \text{ cm}$$

$$\frac{2}{d} = \frac{1}{3} \Rightarrow d = 2 \times 3 = 6 \text{ cm}$$

While a, b, c, d are the rest sides of quadrilateral.

6. The sides of a polygon are 5cm, 2cm, 7cm, 3cm, 4cm. Find the sides of a similar polygon whose side corresponding to 2cm is 6cm. What is the ratio of the perimeters of these two polygons?

Sol: According to the statement the ratio between the correspondign sides is $\frac{2}{6} = \frac{1}{3}$.

$$\frac{1}{3} = \frac{5}{a} = \frac{7}{b} = \frac{3}{c} = \frac{4}{d} \quad \text{thus}$$

$$\frac{5}{a} = \frac{1}{3} \Rightarrow a = 5 \times 3 = 15 \text{ cm}$$

$$\frac{7}{b} = \frac{1}{3} \Rightarrow b = 7 \times 3 = 21 \text{ cm}$$

$$\frac{3}{c} = \frac{1}{3} \Rightarrow c = 3 \times 3 = 9 \text{ cm}$$

$$\frac{4}{d} = \frac{1}{3} \Rightarrow d = 4 \times 3 = 12 \text{ cm}$$

While a, b, c, d are the rest sides of polygon.

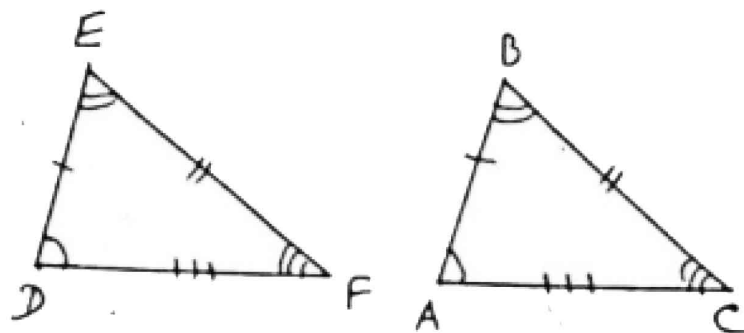
$$\begin{aligned} \text{The perimeter of 1st polygon} &= 5 + 2 + 7 + 3 + 4 \\ &= 21 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{The perimeter of 2nd polygon} &= 15 + 21 + 9 + 12 + 6 \\ &= 63 \text{ cm} \end{aligned}$$

$$\text{The ratio between the perimeter} = \frac{21}{63} = \frac{1}{3} \quad \downarrow \quad 1 : 3$$

7. What are the congruent pairs of corresponding sides and

corresponding angles?



$$\begin{array}{l|l} \overline{AB} \cong \overline{DE} & \angle A \cong \angle D \\ \overline{AC} \cong \overline{DF} & \angle B \cong \angle E \\ \overline{BC} \cong \overline{FE} & \angle C \cong \angle F \end{array}$$

8. Are all similar figures congruent? Explain why?

Sol: All similar figures are equal in size and shape.
Therefore, similar figures are congruent.

9. Are all congruent figures similar? Explain why?

Sol: All congruent figures have same shape but differ in size.
Therefore, congruent figures are not similar.

Exercise 7.4

1. Fill in the blanks.

(a) If $\triangle ABC \cong \triangle FDE$, then

(i) $\overline{AB} =$ _____ (ii) $\overline{BC} =$ _____

(iii) $\overline{AC} =$ _____ (iv) $m\angle A =$ _____

(v) $m\angle B =$ _____ (vi) $m\angle C =$ _____

(b) In $\triangle PQR$, the angle included between side PR and QR is
