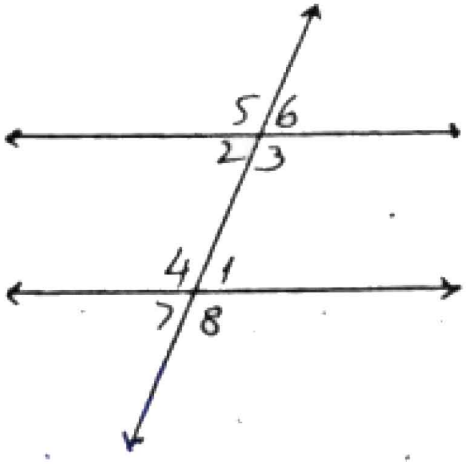
Exercise

1. Look at the given figure and answer the following questions.



(a) The pair of alternative angles

(b) The pair of corresponding angles

(c) The pair of complementary angles

(d) The pair of supplementary angles

(e) The pair of vertical angles

Answers:

a) The pair of alternative interior angles: $(\angle 1, \angle 2)$ *and* $(\angle 3, \angle 4)$

b) The pair of corresponding angles:

$\angle 1, \angle 6; \angle 3, \angle 8; \angle 2, \angle 7; \angle 5, \angle 4$

c) The pair of complementary angles: No one

d) The pair of supplementary angles:

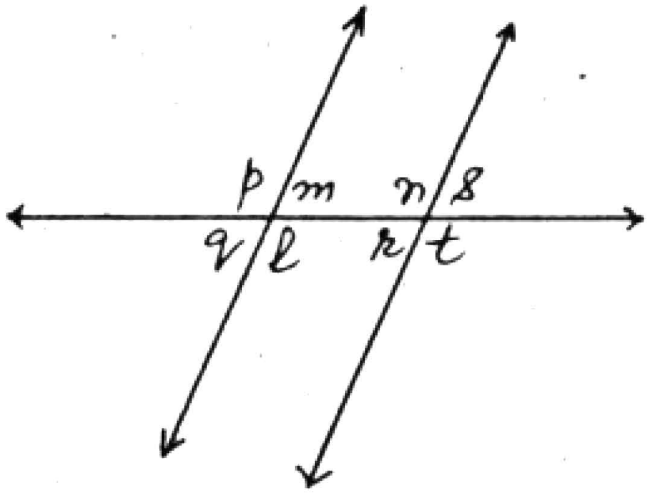
$(\angle 4, \angle 1); (\angle 4, \angle 7); (\angle 7, \angle 8); (\angle 8, \angle 1)$

$(\angle 5, \angle 6); (\angle 5, \angle 2); (\angle 2, \angle 3); (\angle 3, \angle 6)$

e) The pair of vertical angles:

$(\angle 5, \angle 3); (\angle 6, \angle 2); (\angle 4, \angle 6); (\angle 1, \angle 7)$

2. Look at the given figure and answer the following questions.



(a) The pair of alternative interior angles

(b) The pair of corresponding angles

(c) The pair of complementary angles

(d) The pair of supplementary angles

(e) The pair of vertical angles

Answers:

The alternate interior angles : $(\angle n, \angle 1), (\angle m, \angle r)$

The corresponding angles:

$(\angle p, \angle n); (\angle m, \angle s); (\angle q, \angle r); (\angle l, \angle t)$

The complementary angles: No one

The supplementary angles:

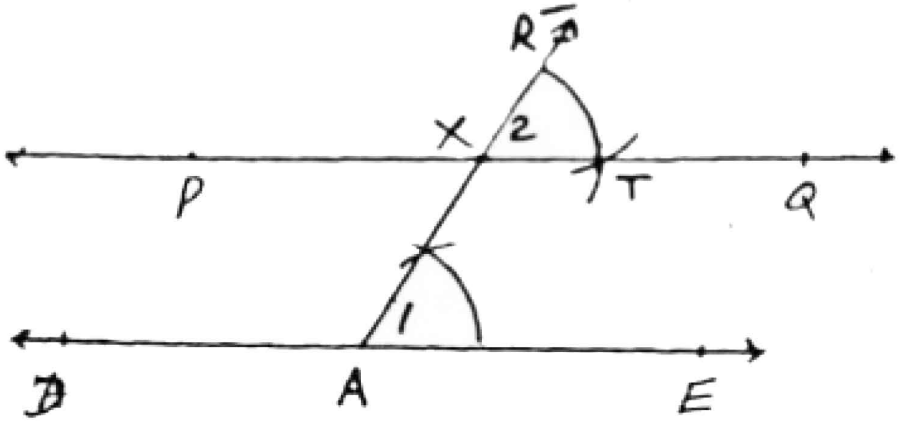
$(\angle p, \angle m); (\angle p, \angle q); (\angle q, \angle l); (\angle l, \angle m)$

$(\angle n, \angle s); (\angle n, \angle r); (\angle r, \angle t); (\angle t, \angle s)$

The vertical angles: $(\angle p, \angle l); (\angle m, \angle q); (\angle n, \angle t); (\angle r, \angle s)$

3. Take a point 'X' outside a line $\overleftrightarrow{DE}$. Draw a line through

'X' which cuts $\overline{DE}$ at some point. Making corresponding angles congruent draw a line parallel to $\overline{DE}$.



Steps of Construction:

(i) Draw a line $\overline{DE}$.

(ii) Take any point "X" which lay outside of $\overline{DE}$.

(iii) Take any point "A" on $\overline{DE}$.

(iv) Join "A" with "X" then extend it

(v) Draw corresponding angles $\angle 1$ & $\angle 2$ with the help of compasses.

(vi) Extend $\overline{XT}$ on both sides.

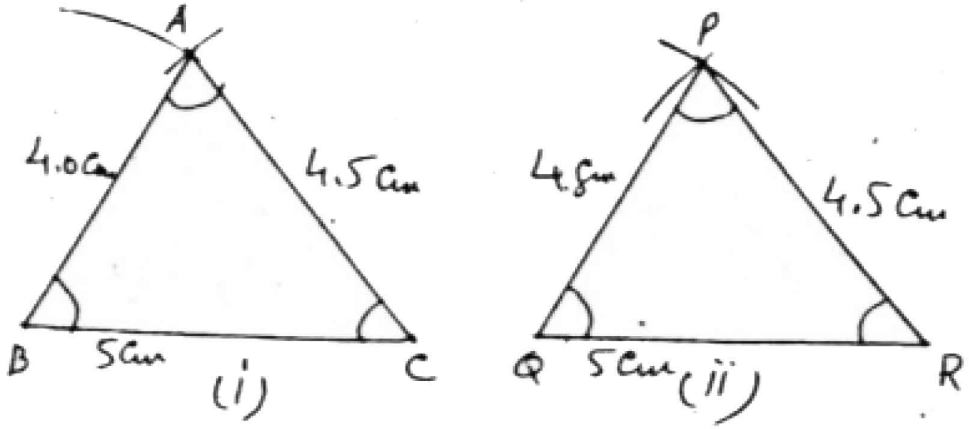
$\overline{PQ} \parallel \overline{DE}$ which passes through X.

CONGRUENT AND SIMILAR FIGURES

Congruent Figures

The word congruent comes from Latin meaning "together agree". Two geometrical figures which ahve the same size and shape are congruent.

One figure is congruent to the other. The symbol for congruent is $\cong$. Thus two segments are congruent when they have the same size.



In figure (i) and (ii)

$$m\overline{AB} = m\overline{PQ}$$

$$m\overline{BC} = m\overline{QR}$$

$$m\overline{CA} = m\overline{RP}$$

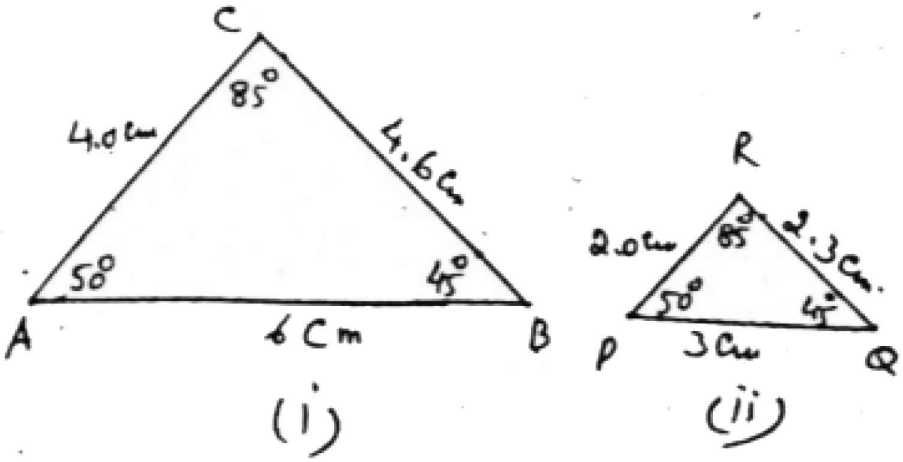
$$m\angle B = m\angle Q$$

$$m\angle C = m\angle R$$

$$m\angle A = m\angle P$$

Similar Figures

In the polygons below, the members of each pair are similar to each other.



In figure (i) and (ii)

$$m\angle A = 50^{0}, \quad m\angle P = 50^{0}$$

$$m\angle B = 45^{0}, \quad m\angle Q = 45^{0}$$

$$m\angle C = 85^{0}, \quad m\angle R = 85^{0}$$

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

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

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

Exercise

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^{O} and 125^{O}.

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