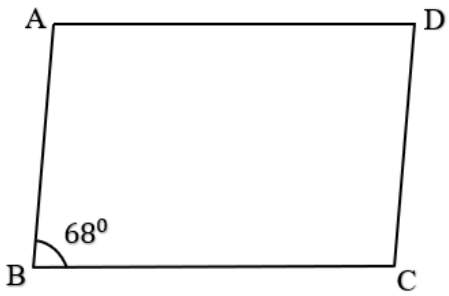
5. Quadrilaterals

Q.1 In the adjoining figure if $\angle B = 68^0$ then find $\angle A$ $\angle C$ and $\angle D$



Solution :

Opposite angles of a parallelogram are equal .

$\angle B = \angle D \Longrightarrow \angle D = 68^0$ ….($\because \angle B = 68^0$ ….. (given)

$\angle B$ and $\angle C$ are supplementary

$$\angle B + \angle C = 180^0$$

$$\angle C = 180^0 - \angle B$$

$$\angle C = 180^0 - 68^0$$

$$\angle C = 112^0$$

$\angle A$ and $\angle C$ are opposite angle.

$\angle A = \angle C$

$\angle A = 112^0$ ……. ($\because \angle C = 112^0$)

Hence, $\angle A = 112^0, \angle D = 68^0 and \angle C = 112^0$

Q.2 Ratio of angle of rectangle is 3:5:9:13, then find the measure of all angle of rectangle.

Solution:

Measure of rectangle are $3x$, $5x$, $9x$ and $13x$.

Sum of all angles of a quadrilateral is 360^0

$$3x + 5x + 9x + 13x = 360$$

$$30x = 360$$

$$x = \frac{360}{30}$$

$$x = 12^0$$

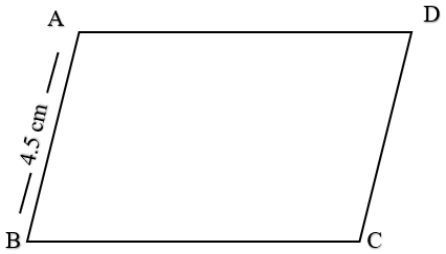
$3x = 3 \times 12 = 36^0$

$5x = 5 \times 12 = 60^0$

$9x = 9 \times 12 = 108^0$

$13x = 13 \times 12 = 156^0$

Q.3 In the adjoining figure ABCD is a parallelogram If AB = 4.5 cm. Perimeter is 21 cm, then find the side of the parallelogram.



Solution : Opposite angle of a parallelogram are equal.

AB = CD = 4.5 cm and BC = AD

Now,

AB + CD + BC + AD = 21 cm

AB + AB + BC + BC = 21 cm

2 [AB + BC] = 21 cm

2 [4.5 + BC] = 21 cm

$[4.5 + BC] = \frac{21}{2}$cm

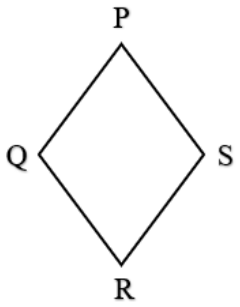
= 11.5 cm

BC = 11.5 – 4.5

BC = 7 cm

∴ BC = 7 cm, CD = 4.5 cm, and AD = 7 cm.

Q.4 Every rhombus is a parallelogram.



Solution : □ PQRS is a parallelogram …..(given)

To prove:□ PQRS is a parallelogram

Proof:

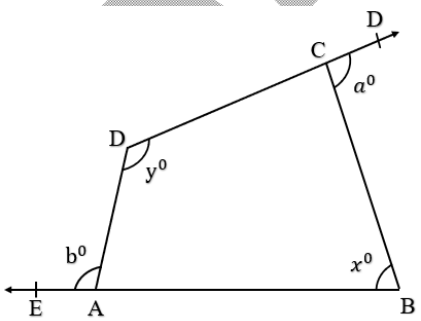
SegPQ = Seg QR = Seg RS = Seg PS …..(given)

∴ side PQ = side RS

side QR = side PS

□ PQRS is a parallelogram …..(Opposite sides of parallelogram)

Q.5 In the adjoining figure ABCD is a parallelogram AE ⊥ DC and CF ⊥ AD. If AB = 18cm AE = 10cm and CF = 20 cm. Find AD.



Solution : AE ⊥ DC, AB = 18cm

AB= CD …. (Opposite of parallelogram)

CD = 18cm

Now,

Area of ABCD is a parallelogram = CD × AE

$= 18 \times 10 cm^2$

$= 180 cm^2$

Now, CF ⊥ AD

Area of ABCD is a parallelogram = AD × CF

AD × CF = 180

AD × 20 = 180

$AD = \frac{180}{20}$

AD = 9 cm

∴ length of AD is 9 cm.