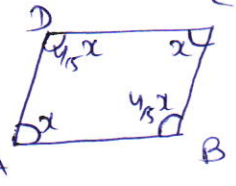
9^{th} – CBSE

PT- 4M- Solution

~~Solution~~

Section : A

1) Opposite angles of the parallelogram are equal.



$\therefore 2\left(x+\frac{4}{5}x\right) = 360^\circ$

$\frac{9x}{5} = 180^\circ$

$\therefore x = \frac{\overset{20}{\cancel{180}} \times 5}{\cancel{9}}$

$x = 100^\circ$

$\rightarrow \frac{4}{5}x = \frac{4}{5} \times 100^\circ$

$\therefore \frac{4}{5}x = 80^\circ$ = Smaller angle

2) (i) Diagonals of kite are perpendicular.
(ii) Two disjoint pair of adjacent sides are equal.

3) Opp. angles of parallelogram are equal.

$\therefore \angle A = \angle C = 80^\circ$.

In ΔBCD, $\angle BDC + \angle C + \angle CBD = 180^\circ$.

$\angle CDB + 80^\circ + 60^\circ = 180^\circ$

$\therefore \boxed{\angle CDB = 40^\circ}$

$\rightarrow \cancel{2}\angle A + \angle B + \angle C + \angle D = 360^\circ$ $\quad \because \angle B = \angle D$.

$280^\circ + 2\angle B + \cancel{\angle C} = 360^\circ$

$80^\circ + \angle B = 180^\circ$

$\therefore \boxed{\angle B = 100^\circ} = \angle D$

$\rightarrow \angle ADB = 100^\circ - 40^\circ$

$= 60^\circ$.

Section : B

4) $\angle XOB = \angle COD = 80^\circ$. $\because$ Vertically opp angles

→ In ΔDCB,

$\angle C = 90^\circ$, $\angle BDC = \angle CBD$

$\therefore \angle BDC + \angle CBD + 90^\circ = 180^\circ$

$\therefore \angle BDC = 45^\circ$.

→ $\therefore \angle DBA = 45^\circ$. $\because \angle B = 90^\circ$.

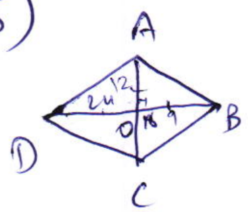
→ $\therefore$ By exterior angle thm,

$\angle x^\circ = \angle XOB + \angle XBO$

$= 80^\circ + 45^\circ$

$\boxed{\angle x^\circ = 125^\circ}$

5)



As we know that the diagonals of the rhombus ~~bisect~~ perpendicular to each other.

In ΔAOB, $AB = ?$
if $AO = 12$ & $OB = 9$.

$AB^2 = AO^2 + BO^2$

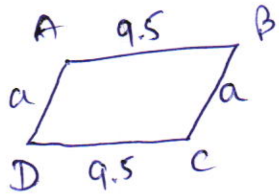
$= 144 + 81$

$AB^2 = 225$

$\therefore AB = 15$

$\therefore$ All the sides of ~~AB~~ rhombus = 15.

6)



If, $AB = CD = 9.5$ cm

also, $BC = AD = a$

$AB + BC + CD + AD = 30$

$9.5 + a + 9.5 + a = 30$

$2a = 30 - 19$

$2a = 11$ $\therefore a = 5.5$ cm

$\therefore AB = CD = 9.5\,cm$

& $BC = AD = 5.5\,cm$

Section : C

7) Given: $\square ABCD$ in which $\angle A = \angle C$ & $\angle B = \angle D$.

To prove: $\square ABCD$ is a parallelogram.

Proof : In $\square ABCD$,

$\angle A = \angle C$

& $\angle B = \angle D$

$\angle A + \angle B = \angle C + \angle D$.

$\angle A + \angle B + \angle C + \angle D = 360^\circ$.

→ since, $\angle A + \angle B + \angle C + \angle D = 360^\circ$.

$(\angle A + \angle B) + (\angle B + \angle A) = 360^\circ$.

$2(\angle A + \angle B) = 360^\circ$.

$\therefore \angle A + \angle B = 180^\circ = \angle C + \angle D$.

→ line AB intersects AD & BC at A & B resp. such that

AD || BC. —(i)

Again $\angle A + \angle B = 180^\circ$

& $\angle C + \angle B = 180^\circ$ $\because \angle A = \angle C$

→ Now, line BC intersects AB & DC at A & C resp.

$\therefore \angle B + \angle C = 180^\circ$.

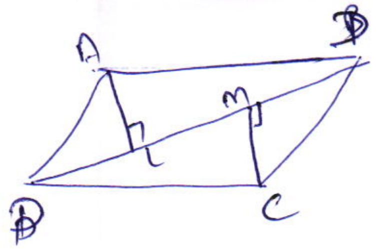
i.e. AB || DC. —(ii)

$\therefore$ from (i) & (ii) we have,

AD || BC & AB || DC

$\therefore$ ABCD is a parallelogram.

8)



→ As $\square ABCD$ is a parallelogram.

$AD \parallel BC$. and also $AD = BC$. —(i)

for transversal BD of $AD \parallel BC$.

we have, ∵ Alternate Int. angles

$\angle ADB = \angle DBC$

i.e $\angle ADL = \angle MBC$ —(ii)

→ Now, In ΔALD & ΔCMB we have,

$\angle ALD = \angle CMB$ ∵ each $= 90°$

$\angle ADL = \angle MBC$ ∵ by (ii)

$AD = BC$ ∵ by (i)

∴ By AAS congruence criterion we have,

$\boxed{\Delta ALD \cong \Delta CMB.}$

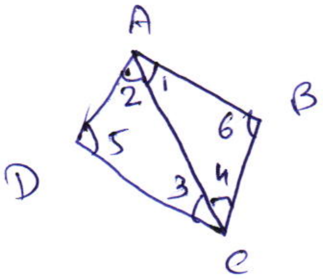
→ Also, by CPCT we have,

$\boxed{AL = CM.}$

9) Given: A quadrilateral ABCD.

To prove: $\angle A + \angle B + \angle C + \angle D = 360°$.

Construction: Join AC.



→ In ΔABC,

$\angle 1 + \angle 4 + \angle 6 = 180°$. —(i)

In ΔADC, $\angle 2 + \angle 3 + \angle 5 = 180°$. —(ii)

→ Adding (i) & (ii) we get,

$\underline{\angle 1 + \angle 2} + \underline{\angle 3 + \angle 4} + \angle 5 + \angle 6 = 360°$.

$\angle A + \angle C + \angle B + \angle D = 360°$

∴ $\boxed{\angle A + \angle B + \angle C + \angle D = 360°}$