Exercise 4C

Question 1:

Since AB and CD are given to be parallel lines and t is a transversal.

So, $\angle 5 = \angle 1 = 70^\circ$ [Corresponding angles are equal]

$\angle 3 = \angle 1 = 70^\circ$ [Vertically opp. Angles]

$\angle 3 + \angle 6 = 180^\circ$ [Co-interior angles on same side]

$\therefore \angle 6 = 180^\circ - \angle 3$

$= 180^\circ - 70^\circ = 110^\circ$

$\angle 6 = \angle 8$ [Vertically opp. Angles]

$\Rightarrow \angle 8 = 110^\circ$

$\Rightarrow \angle 4 + \angle 5 = 180^\circ$ [Co-interior angles on same side]

$\angle 4 = 180^\circ - 70^\circ = 110^\circ$

$\angle 2 = \angle 4 = 110^\circ$ [Vertically opposite angles]

$\angle 5 = \angle 7$ [Vertically opposite angles]

So, $\angle 7 = 70^\circ$

$\therefore \angle 2 = 110^\circ$, $\angle 3 = 70^\circ$, $\angle 4 = 110^\circ$, $\angle 5 = 70^\circ$, $\angle 6 = 110^\circ$, $\angle 7 = 70^\circ$ and $\angle 8 = 110^\circ$.

Question 2:

Since $\angle 2 : \angle 1 = 5 : 4$.

Let $\angle 2$ and $\angle 1$ be 5x and 4x respectively.

Now, $\angle 2 + \angle 1 = 180^\circ$, because $\angle 2$ and $\angle 1$ form a linear pair.

So, $5x + 4x = 180^\circ$

$\Rightarrow 9x = 180^\circ$

$\Rightarrow x = 20^\circ$

$\therefore \angle 1 = 4x = 4 \times 20^\circ = 80^\circ$

And $\angle 2 = 5x = 5 \times 20^\circ = 100^\circ$

$\angle 3 = \angle 1 = 80^\circ$ [Vertically opposite angles]

And $\angle 4 = \angle 2 = 100^\circ$ [Vertically opposite angles]

$\angle 1 = \angle 5$ and $\angle 2 = \angle 6$ [Corresponding angles]

So, $\angle 5 = 80^\circ$ and $\angle 6 = 100^\circ$

$\angle 8 = \angle 6 = 100^\circ$ [Vertically opposite angles]

And $\angle 7 = \angle 5 = 80^\circ$ [Vertically opposite angles]

Thus, $\angle 1 = 80^\circ$, $\angle 2 = 100^\circ$, $\angle 3 = \angle 80^\circ$, $\angle 4 = 100^\circ$, $\angle 5 = 80^\circ$, $\angle 6 = 100^\circ$, $\angle 7 = 80^\circ$ and $\angle 8 = 100^\circ$.

Question 3:

Given: AB || CD and AD || BC

To Prove: $\angle ADC = \angle ABC$

Proof: Since AB || CD and AD is a transversal. So sum of consecutive interior angles is 180°.

$\Rightarrow \angle BAD + \angle ADC = 180^\circ$ ....(i)

Also, AD || BC and AB is transversal.

So, $\angle BAD + \angle ABC = 180^\circ$ ....(ii)

From (i) and (ii) we get:

$\angle BAD + \angle ADC = \angle BAD + \angle ABC$

$\Rightarrow \angle ADC = \angle ABC$ (Proved)

*********** END **********