Exercise 4C

Question 1:
Since AB and CD are given to be parallel lines and t is a transversal.
So, $\angle 5 = \angle 1 = 70^{o}$ [Corresponding angles are equal]
$\angle 3 = \angle 1 = 70^{o}$ [Vertically opp. Angles]
$\angle 3 + \angle 6 = 180^{o}$ [Co-interior angles on same side]
$\therefore \angle 6 = 180^{o} - \angle 3$
$= 180^{o} - 70^{o} = 110^{o}$
$\angle 6 = \angle 8$ [Vertically opp. Angles]
$\Rightarrow \angle 8 = 110^{o}$
$\Rightarrow \angle 4 + \angle 5 = 180^{o}$ [Co-interior angles on same side]
$\angle 4 = 180^{o} - 70^{o} = 110^{o}$
$\angle 2 = \angle 4 = 110^{o}$ [Vertically opposite angles]
$\angle 5 = \angle 7$ [Vertically opposite angles]
So, $\angle 7 = 70^{o}$
$\therefore \angle 2 = 110^{o}, \angle 3 = 70^{o}, \angle 4 = 110^{o}, \angle 5 = 70^{o}, \angle 6 = 110^{o}, \angle 7 = 70^{o}$ and $\angle 8 = 110^{o}$.

Question 2:
Since $\angle 2 : \angle 1 = 5 : 4$.
Let $\angle 2$ and $\angle 1$ be 5x and 4x respectively.
Now, $\angle 2 + \angle 1 = 180^{o}$, because $\angle 2$ and $\angle 1$ form a linear pair.
So, $5x + 4x = 180^{o}$
$\Rightarrow 9x = 180^{o}$
$\Rightarrow x = 20^{o}$
$\therefore \angle 1 = 4x = 4 \times 20^{o} = 80^{o}$
And $\angle 2 = 5x = 5 \times 20^{o} = 100^{o}$
$\angle 3 = \angle 1 = 80^{o}$ [Vertically opposite angles]
And $\angle 4 = \angle 2 = 100^{o}$ [Vertically opposite angles]
$\angle 1 = \angle 5$ and $\angle 2 = \angle 6$ [Corresponding angles]
So, $\angle 5 = 80^{o}$ and $\angle 6 = 100^{o}$
$\angle 8 = \angle 6 = 100^{o}$ [Vertically opposite angles]
And $\angle 7 = \angle 5 = 80^{o}$ [Vertically opposite angles]
Thus, $\angle 1 = 80^{o}, \angle 2 = 100^{o}, \angle 3 = \angle 80^{o}, \angle 4 = 100^{o}, \angle 5 = 80^{o}, \angle 6 = 100^{o}, \angle 7 = 80^{o}$ and $\angle 8 = 100^{o}$.

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^{o}.
$\Rightarrow \angle BAD + \angle ADC = 180^{o}$ ....(i)
Also, AD || BC and AB is transversal.
So, $\angle BAD + \angle ABC = 180^{o}$ ....(ii)
From (i) and (ii) we get:
$\angle BAD + \angle ADC = \angle BAD + \angle ABC$
$\Rightarrow \angle ADC = \angle ABC$ (Proved)

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