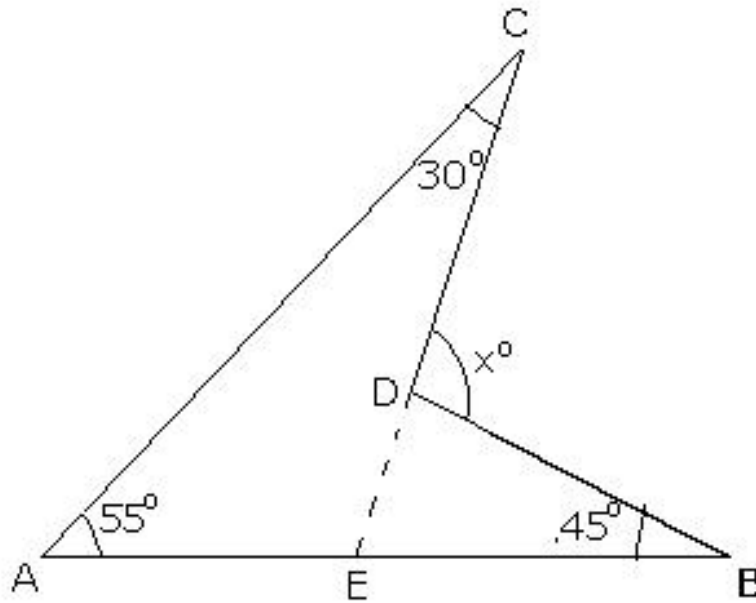Exercise 4D

Question 18:
Produce CD to cut AB at E.

Now, in ΔBDE, we have,
Exterior $\angle$CDB = $\angle$CEB + $\angle$DBE
$\Rightarrow x^{\circ} = \angle CEB + 45^{\circ}$ .....(i)
In ΔAEC, we have,
Exterior $\angle$CEB = $\angle$CAB + $\angle$ACE
= $55^{\circ} + 30^{\circ} = 85^{\circ}$
Putting $\angle$CEB = 85° in (i), we get,
$x^{\circ} = 85^{\circ} + 45^{\circ} = 130^{\circ}$
$\therefore$ x = 130

Question 19:
The angle $\angle$BAC is divided by AD in the ratio 1 : 3.
Let $\angle$BAD and $\angle$DAC be y and 3y, respectively.
As BAE is a straight line,
$\angle$BAC + $\angle$CAE = 180° [linear pair]
$\Rightarrow$ $\angle$BAD + $\angle$DAC + $\angle$CAE = 180°
$\Rightarrow$ y + 3y + 108° = 180°
$\Rightarrow$ 4y = 180° - 108° = 72°
$\Rightarrow$ y =72/4 = 18°
Now, in ΔABC,
$\angle$ABC + $\angle$BCA + $\angle$BAC = 180°
y + x + 4y = 180°
[Since, $\angle$ABC = $\angle$BAD (given AD = DB) and $\angle$BAC = y + 3y = 4y]
$\Rightarrow$ 5y + x = 180
$\Rightarrow$ 5 × 18 + x = 180
$\Rightarrow$ 90 + x = 180
$\therefore$ x = 180 - 90 = 90

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