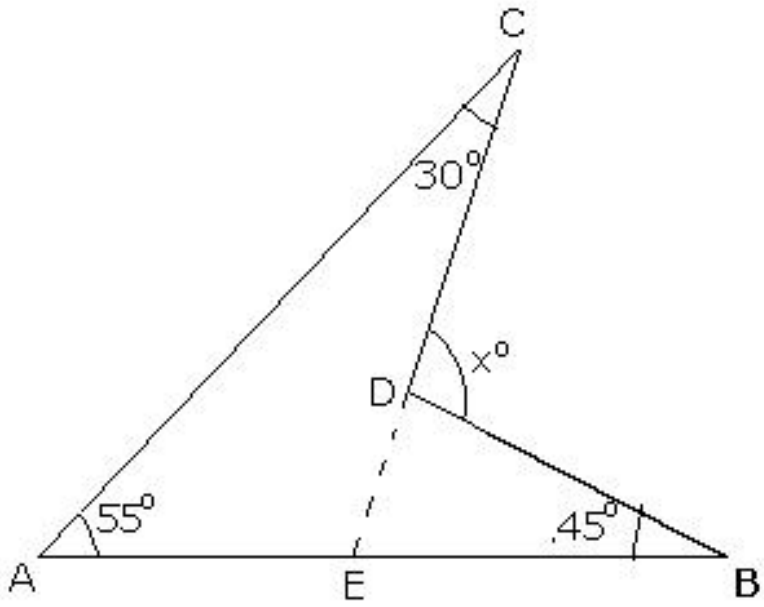
Exercise 4D

Question 18:
Produce CD to cut AB at E.



Now, in ΔBDE, we have,
Exterior ∠CDB = ∠CEB + ∠DBE
⇒ $x^o = ∠CEB + 45^o$ .....(i)
In ΔAEC, we have,
Exterior ∠CEB = ∠CAB + ∠ACE
$= 55^o + 30^o = 85^o$
Putting $∠CEB = 85^o$ in (i), we get,
$x^o = 85^o + 45^o = 130^o$
∴ x = 130

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

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