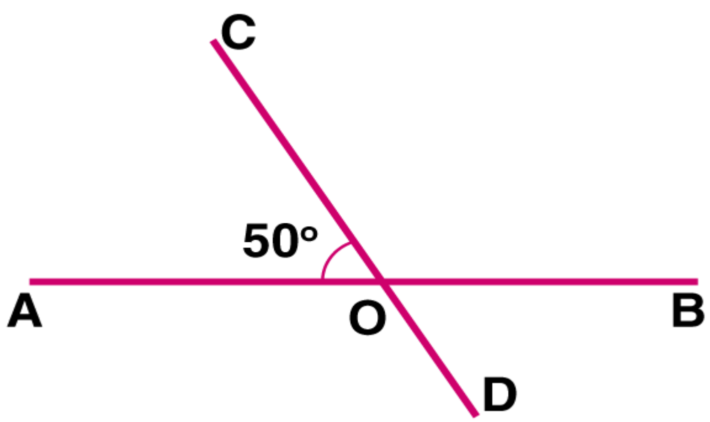
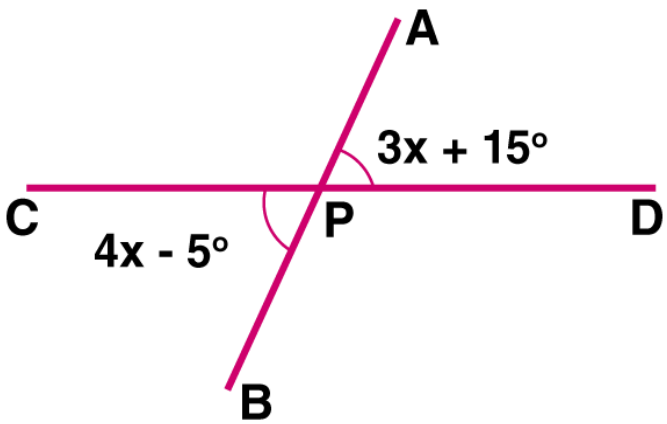
EXERCISE 25(A)

1. Two straight lines AB and CD intersect each other at a point O and angle AOC = 50^0; find:
(i) angle BOD
(ii) ∠AOD
(iii) ∠BOC



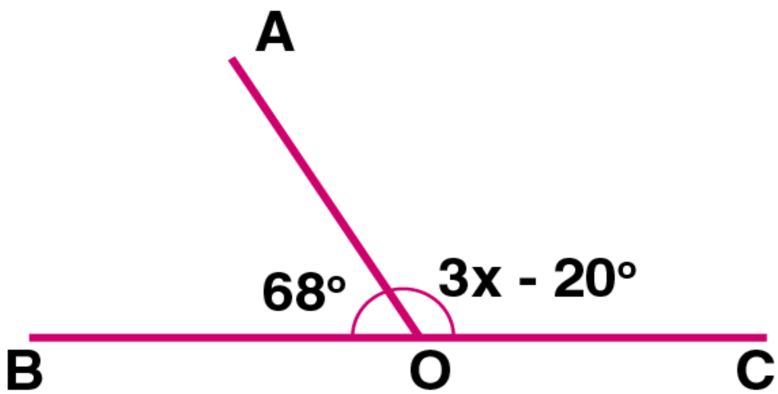
Solution:
(i) ∠BOD
Given ∠AOC = 50^0
We know that,
Vertically opposite angles are equal
So, ∠BOD = ∠AOC
Therefore, ∠BOD = 50^0
(ii) ∠AOD
∠AOD + ∠BOD = 180^0
∠AOD + 50^0 = 180^0 {From (i)}
∠AOD = $180^0 – 50^0$
We get,
∠AOD = 130^0
(iii) ∠BOC
We know that,
Vertically opposite angles are equal
So, ∠BOC = ∠AOD
Therefore, ∠BOC = 130^0

2. The adjoining figure, shows two straight lines AB and CD intersecting at P. If ∠BPC = 4x – 5^0 and ∠APD = 3x + 15^0; find:



(i) the value of x
(ii) ∠APD
(iii) ∠BPD
(iv) ∠BPC
Solution:
(i) The value of x is calculated as,
$3x + 15^0 = 4x – 5^0$
$3x – 4x = - 5^0 - 15^0$
$- x =- 20^0$
$x = 20^0$
(ii) the value of ∠APD is calculated as,
$\angle APD = 3x + 15^0$
$= 3 \times 20^0 + 15^0$
We get,
$= 60^0 + 15^0$
$= 75^0$
(iii) The value of ∠BPD is calculated as,
$\angle BPD = 180 – \angle BPC$
$= 180^0 – (4x - 5^0)$
$= 180^0 – (4 \times 20^0 – 5^0)$
$= 180^0 – 80^0 + 5^0$
We get,
$= 105^0$
(iv) The value of ∠BPC is calculated as,
$\angle BPC = (4x – 5^0)$
$= (4 \times 20^0 – 5^0)$
We get,
$= 80^0 - 5^0$
$= 75^0$

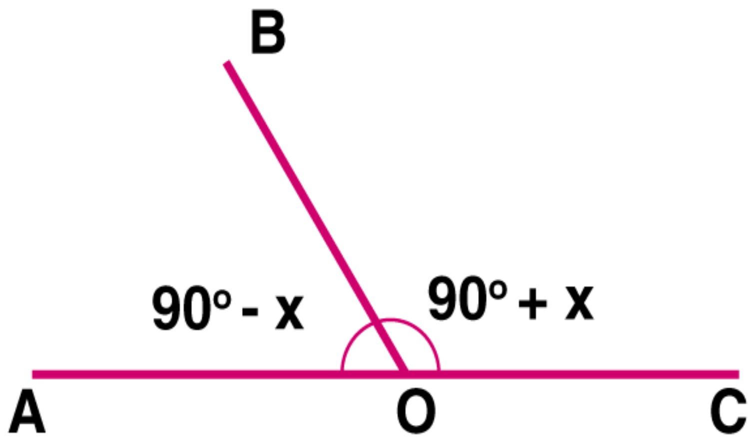
3. The given diagram, shows two adjacent angles AOB and AOC, whose exterior sides are along the same straight line. Find the value of x.



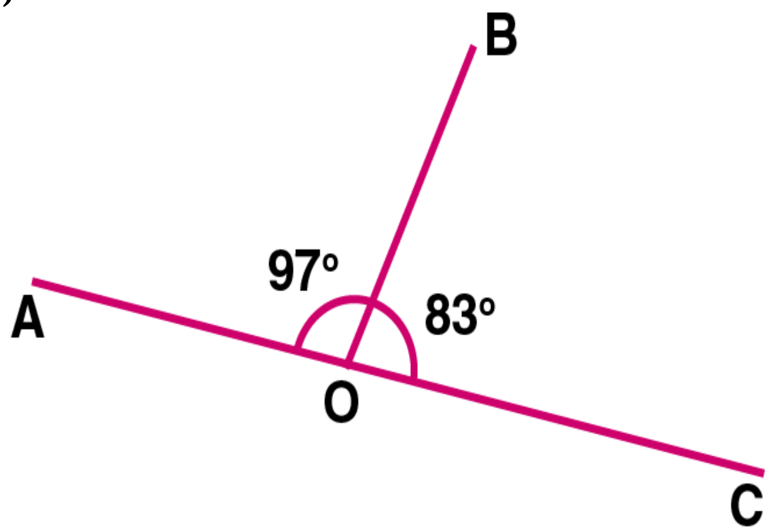
Solution:

Here, the exterior arms of the adjacent angles are in a straight line,
Hence, the adjacent angles are supplementary
$\angle AOB + \angle AOC = 180^0$
$68^0 + (3x - 20^0) = 180^0$
$68^0 + 3x - 20^0 = 180^0$
$3x = 180^0 + 20^0 - 68^0$
$3x = 200^0 - 68^0$
We get,
$3x = 132^0$
$x = 132^0 / 3$
$x = 44^0$

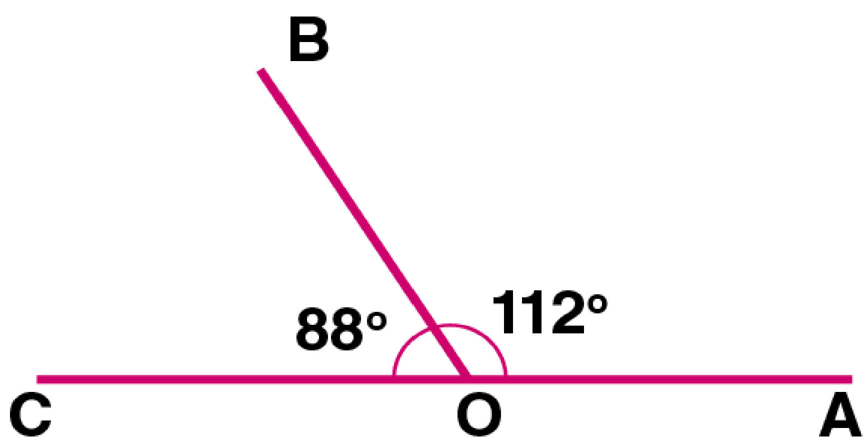
4. Each figure given below shows a pair of adjacent angles AOB and BOC. Find whether or not the exterior arms OA and OC are in the same straight line.
(i)



(ii)



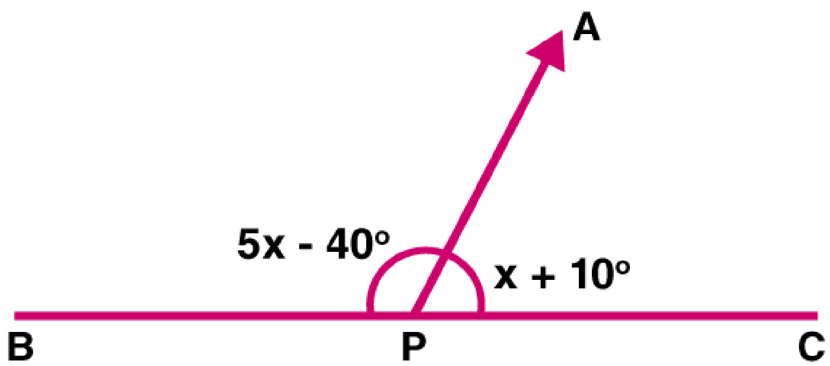
(iii)



Solution:
(i) We know that,
The sum of adjacent angles AOB and COB = 180^0

Hence,
$\angle AOB + \angle COB = 180^0$
$(90^0 - x) + (90^0 + x) = 180^0$
$90^0 - x + 90^0 + x = 180^0$
We get,
$180^0 = 180^0$
The exterior arms OA and OC are in the same straight line
(ii) $\angle AOB + \angle BOC = 97^0 + 83^0$
$= 180^0$
The sum of adjacent angles AOB and BOC is 180^0
Hence, the exterior arms OA and OC are in the same straight line
(iii) $\angle COB + \angle AOB = 88^0 + 112^0$
We get,
$= 200^0$ [which is not equal to 180^0]
Hence, the exterior arms OA and OC are not in the same straight line

5. A line segment AP stands at point P of a straight line BC such that $\angle APB = 5x - 40^0$ and $\angle APC = x + 10^0$; find the value of x and angle APB.
Solution:
Given
A line segment AP stands at P and
$\angle APB = 5x - 40^0$
$\angle APC = x + 10^0$



(i) BPC is a straight line
$\angle APB + \angle APC = 180^0$
$5x - 40^0 + x + 10^0 = 180^0$
$6x - 30^0 = 180^0$
$6x = 180^0 + 30^0$
We get,
$6x = 210^0$

$x = 210^0 / 6$
$x = 35^0$
(ii) $\angle APB = 5x - 40^0$
$= 5 \times 35^0 - 40^0$
We get,
$= 175^0 – 40^0$
$= 135^0$