MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

TRIANGLES

Solved Examples

1. The angles of a triangle are in the ratio 4: 5: 6. Find the angles.

A. $48^\circ, 60^\circ$ and 72°.

B. $48^\circ, 60^\circ$ and 82°.

C. $58^\circ, 60^\circ$ and 72°.

D. $48^\circ, 70^\circ$ and 72°.

Answer: A

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2. In ΔABC, $2\angle A = 3\angle B = 6\angle C$, then find $\angle A$.

A. 90°

B. 30°

C. 60°

D. 45°

Answer: A

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3. In a ΔABC, $\angle A + \angle B = 65^\circ$ and $\angle B + \angle C = 140^\circ$. Find the angles.

A. $\angle A = 40^\circ, \angle B = 35^\circ$ and $\angle B = 35^\circ$ and $\angle C = 115^\circ$.

B. $\angle A = 40^\circ, \angle B = 25^\circ$ and $\angle B = 25^\circ$ and $\angle C = 115^\circ$.

C. $\angle A = 40^\circ, \angle B = 25^\circ$ and $\angle B = 25^\circ$ and $\angle C = 125^\circ$.

D. $\angle A = 50^\circ, \angle B = 25^\circ$ and $\angle B = 25^\circ$ and $\angle C = 115^\circ$.

Answer: B

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4. In a $\Delta ABC, \angle A - \angle B = 33^\circ$ and $\angle B - \angle C = 18^\circ$. Find the angles of the triangle.

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5. In a $\Delta ABC,$ the bisectors of $\angle B$ and $\angle C$ intersect each other point O. Then $\angle BOC$ is ?

A. $\angle BOC = 180^\circ + \frac{1}{2}\angle A.$

B. $\angle BOC = 90^\circ + \frac{1}{2}\angle A.$

C. $\angle BOC = 180^\circ - \frac{1}{2}\angle A.$

D. $\angle BOC = 90^\circ - \frac{1}{2}\angle A.$

Answer: B

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6. In a $\Delta ABC, BE \perp AC, \angle EBC = 40^\circ$ and $\angle CAD = 30^\circ$. If $\angle ACD = x^\circ$ a

find the values of x and y.

A. x=80 and y=50

B. x=50 and y=70

C. x=50 and y=80

D. x=70 and y=80

Answer: C

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7. If two parallel lines are intersected by a transversal, prove that the bisectors of the interior angles on the same side of transversal intersect each other at right angles.

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8. The bisectors of base angles of a triangle cannot enclose a right angle in any case.

A. yes

B. no

C. cannot determine

D. none of the above

Answer: B

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9. In the given figure, ΔABC is an isosceles triangle in which AB=AC and AE bisects $\angle CAD$. Prove that $AE \| BC$.

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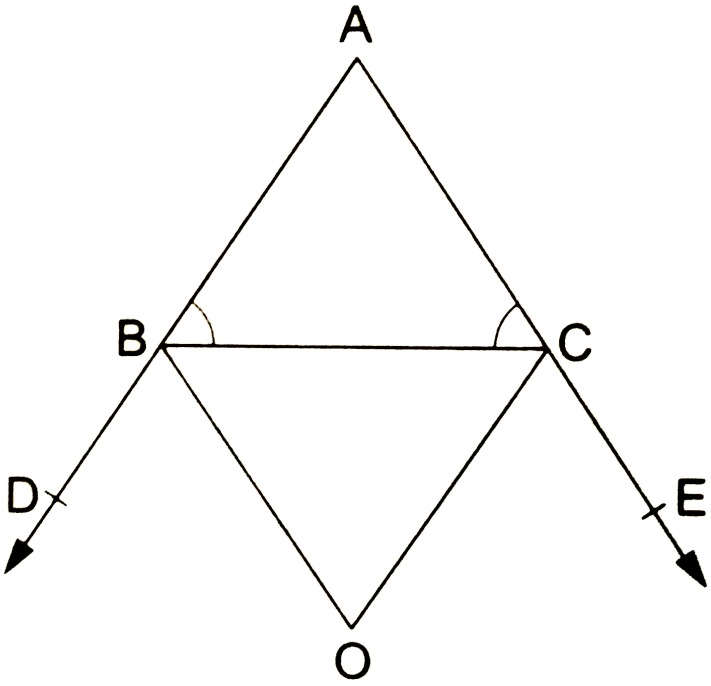
Example

1. In a ΔABC the sides AB and AC are produced to points D and E respectively. The bisectors of $\angle DBC$ and $\angle ECB$ intersect at a point O.

Prove that $\angle BOC = \left(90^\circ - \frac{1}{2}\angle A\right)$.



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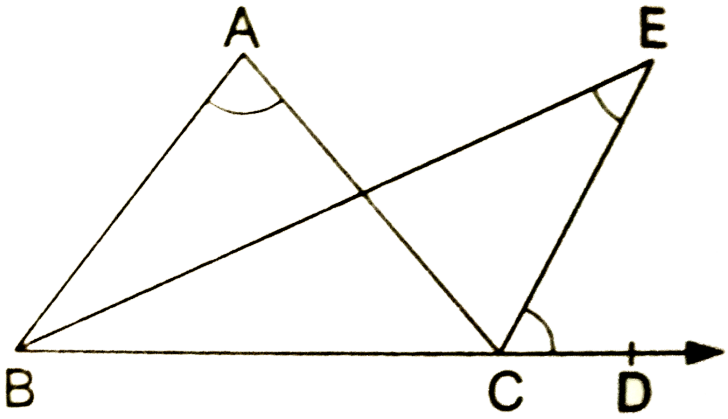
2. In the given figure, the side BC of ΔABC has been produced to a point D. If the bisectors of $\angle ABC$ and $\angle ACD$ meet at point E then prove that

$\angle BEC = \frac{1}{2}\angle BAC.$



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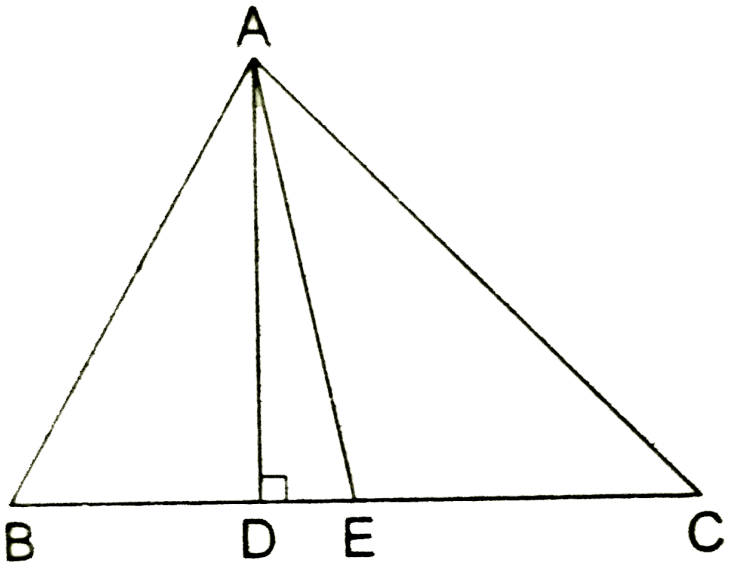
3. In a $\Delta ABC, \angle B > \angle C$. If $AD \perp BC$ and AE is the bisector of $\angle BAC$ then prove that $\angle DAE = \frac{1}{2}(\angle B - \angle C)$.



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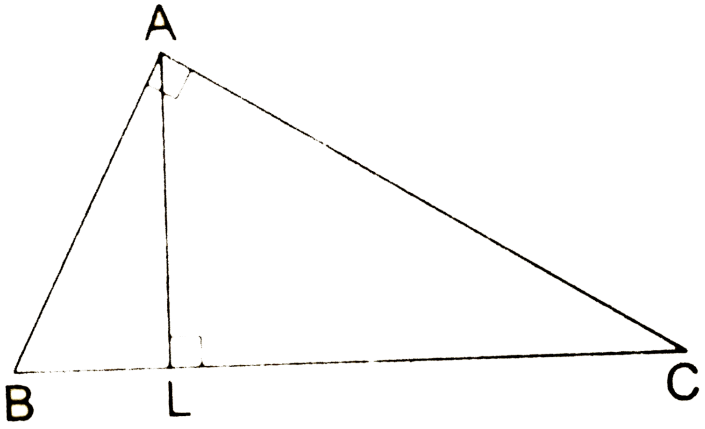
4. A ΔABC is right angled at A and L is a point on BC such that $AL \perp BC$. Prove that $\angle BAL = \angle ACB$.



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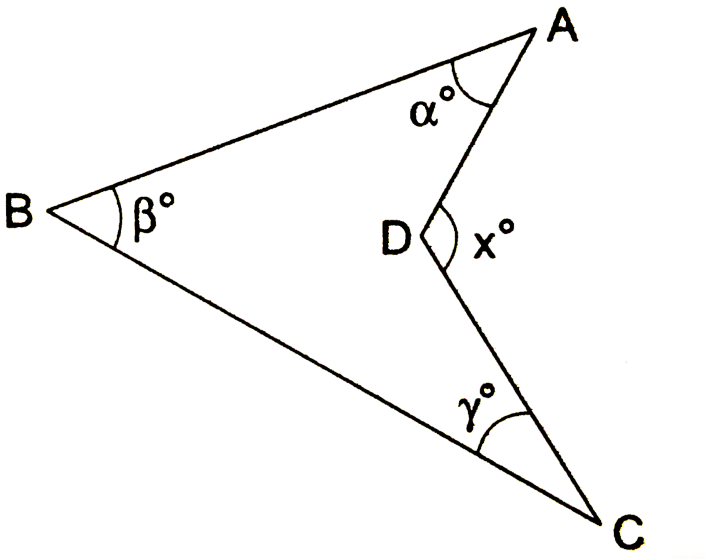
5. In the given figure, prove that $x = \alpha + \beta + \gamma$.



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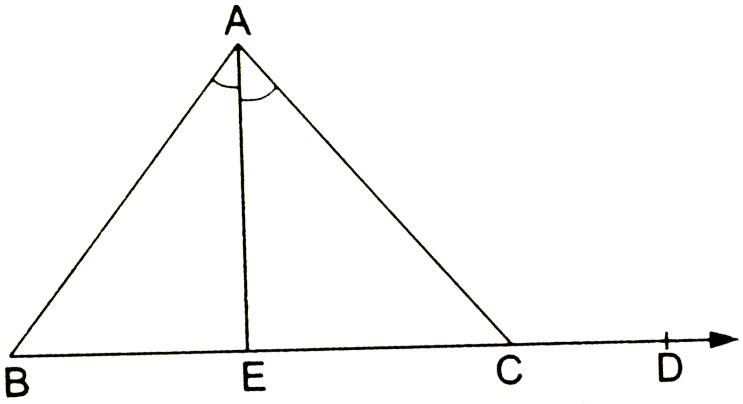
6. The side BC of ΔABC is produced ot D. The bisector of $\angle A$ meets BC at E. Prove that $\angle ABC + \angle ACD = 2\angle AEC$.



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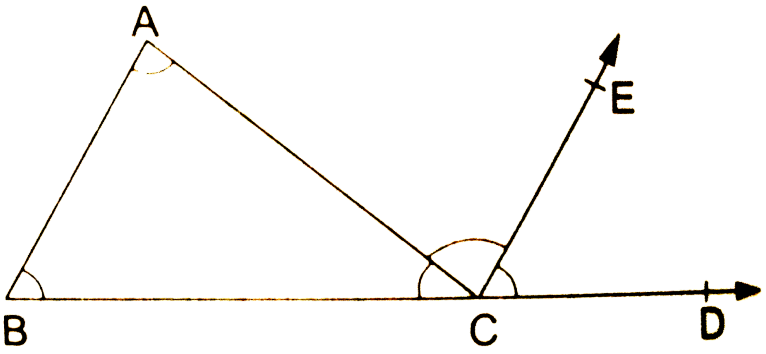
7. In the given figure, side BC of ΔABC is produced to form ray BD and $CE \| BA$. Show that $\angle ACD = \angle A + \angle B$. Deduce that

$\angle A + \angle B + \angle C = 180^\circ$.



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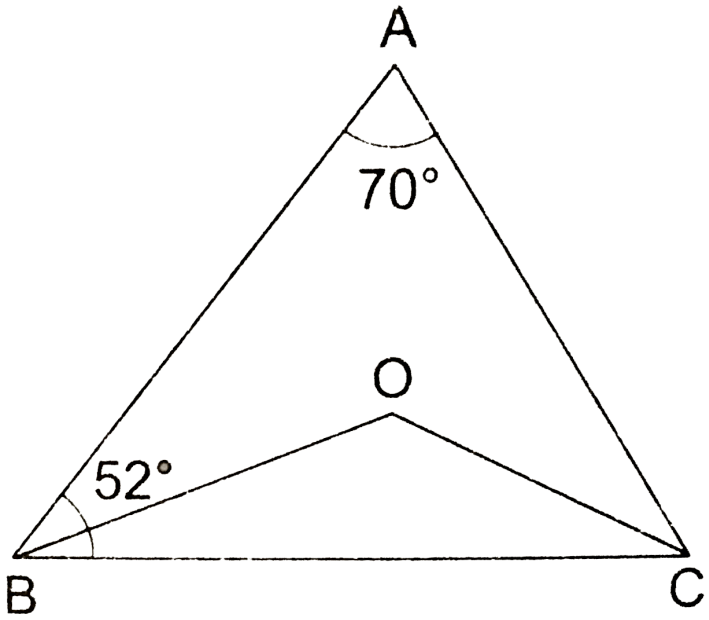
8. In ΔABC it is given that $\angle A = 70^\circ$, $\angle B = 52^\circ$, BO and CO are the bisectors of $\angle B$ and $\angle C$ respectively. Find $\angle OCB$ and $\angle BOC$.



A. 29 and 125

B. 26 and 125

C. 56 and 125

D. 58 and 56

Answer: A

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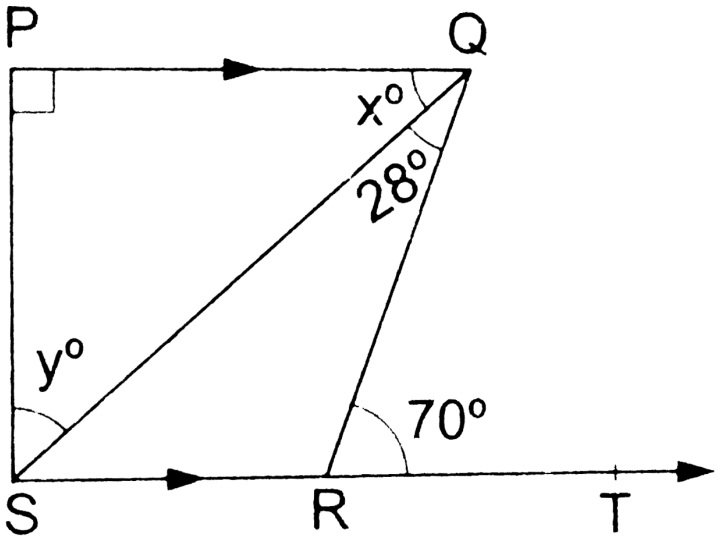
9. In the given figure, $PQ \perp PS, PQ \| SR, \angle SQR = 28^\circ$ and $\angle QRT = 70^\circ$. If $\angle PQS = x^\circ$, find the values of x and y.



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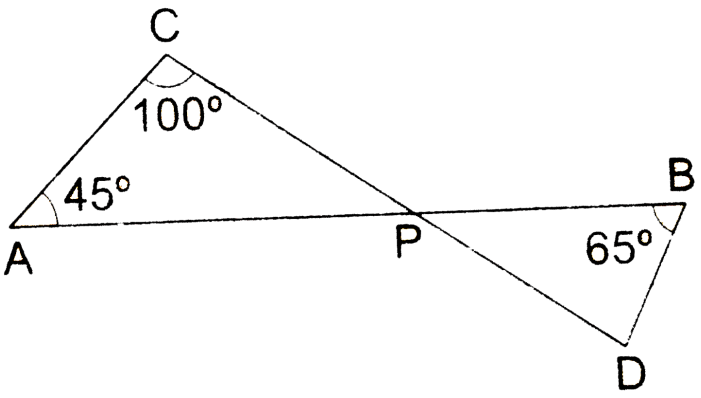
10. In the given figure, lines AB and CD intersect at a point P such that $\angle PAC = 45^\circ, \angle ACP = 100^\circ$ and $\angle PBD = 65^\circ$. Find $\angle CPA, \angle DPB$



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Exercise 8

1. In ΔABC, if $\angle B = 76^\circ$ and $\angle C = 48^\circ$ find $\angle A$.

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2. If the angles of a triangle are in the ratio $2:3:4$, determine three angles.

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3. In ΔABC, if $3\angle A = 4\angle B = 6\angle C$, calculate $\angle A$, $\angle B$ and $\angle C$.

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4. In ΔABC, if $\angle A + \angle B = 180^\circ$ and $\angle B + \angle C = 130^\circ$, find $\angle A$, $\angle B$ and .

A. $\angle A = 45^\circ, \angle B = 58^\circ, \angle C = 72^\circ$

B. $\angle A = 50^\circ, \angle B = 58^\circ, \angle C = 75^\circ$

C. $\angle A = 50^\circ, \angle B = 58^\circ, \angle C = 72^\circ$

D. $\angle A = 50^\circ, \angle B = 48^\circ, \angle C = 72^\circ$

Answer: C

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5. In ΔABC, if $\angle A + \angle B = 125^\circ$ and $\angle A + \angle C = 113^\circ$, find $\angle A, \angle B$ and .

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6. In ΔPQR, if $\angle P - \angle Q = 42^\circ$ and $\angle Q - \angle R = 21^\circ$, find $\angle P, \angle Q$ and $\angle$.

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7. The sum of two angles of a triangle is 116° and their difference is 24°. Find the measure of each angle of the triangle.

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8. Two angles of a triangle are equal and the third angle is greater than each one of them by 18°. Find the angles.

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9. Of the three angles of a triangle, one is twice the smallest and another one is thrice the smallest. Find the angles.

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10. In a right-angled triangle, one of the acute angles measures 53°. Find the measure of other angle of the triangle.

A. 17°

B. 27°

C. 37°

D. 47°

Answer: C

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11. If one angles of a triangle is equal to the sum of the other two, show that the triangle is right angled.

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12. If each angle of a triangle is less than the sum of the other two, show that the triangle is acute angled.

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13. If one angles of a triangle is greater than the sum of the other two, show that the triangle is obtuse angled.

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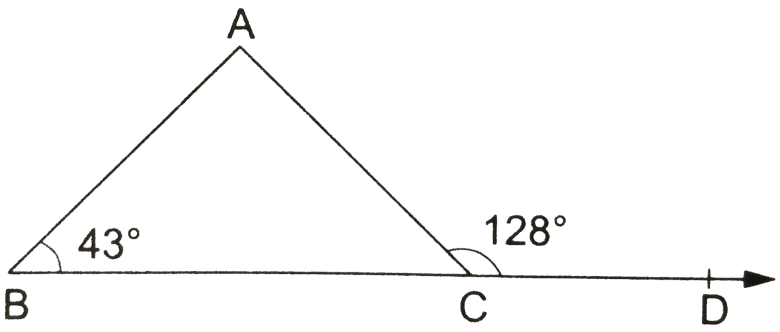
Exercise

1. In the given figure, side BC of ΔABC is produced to D. If $\angle ACD = 128^\circ$ and $\angle ABC = 43^\circ$, find $\angle BAC$ and $\angle ACB$



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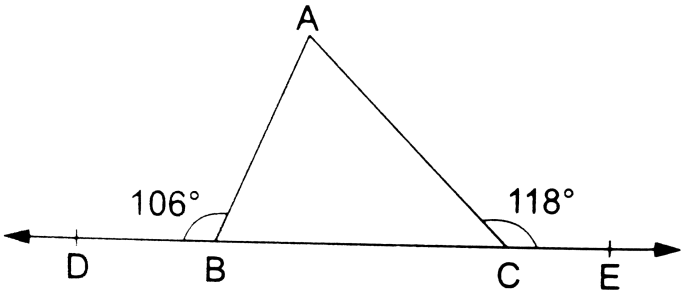
2. In the given figure, the side BC of ΔABC has been produced on the left-hand side from B to D and on the right-hand side from C to E. If $\angle ABD = 106^\circ$ and $\angle ACE = 118^\circ$, find the meaure of each angle of

the triangle.



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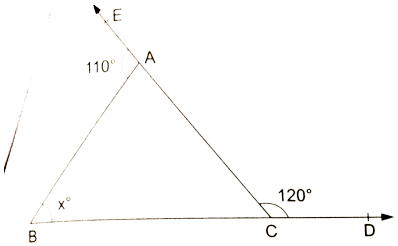
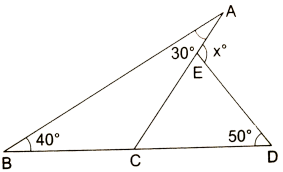
3. Calculate the value of x in each of the following figures.



(i)



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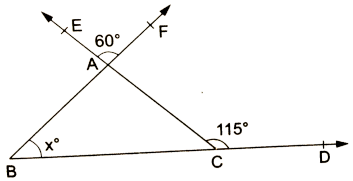

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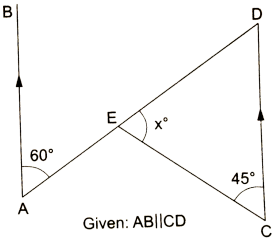

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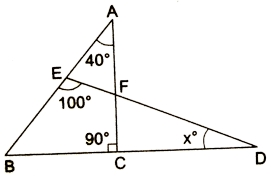
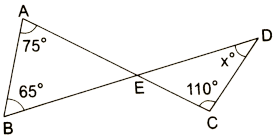


(v)



(vi)

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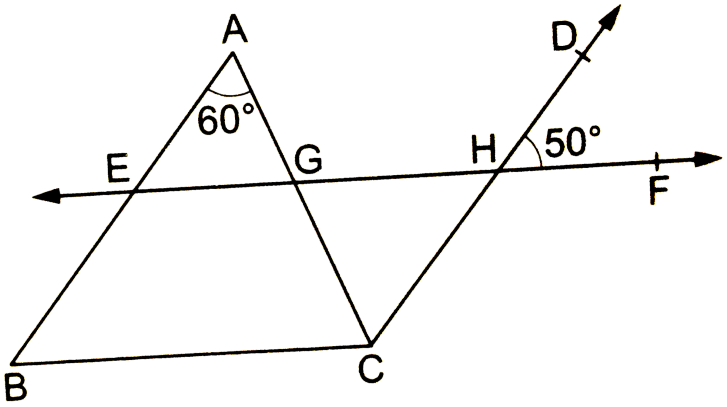
4. In the figure given alongside, $AB||CD, EF||BC, \angle BAC = 60^\circ$ and $\angle DHF = 50^\circ$. Find $\angle GCH$ and

.



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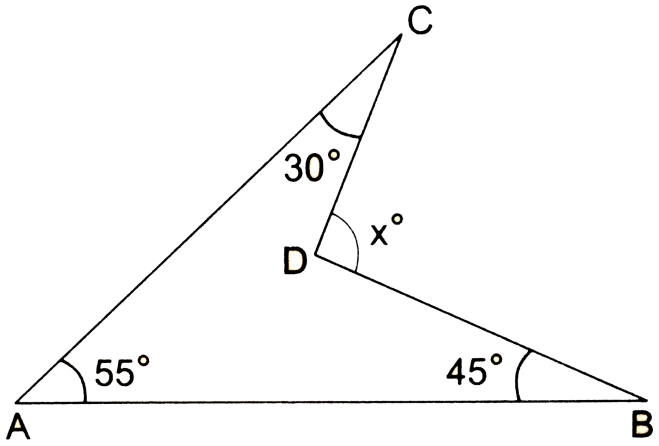
5. Calculate the value of x in the given figure.



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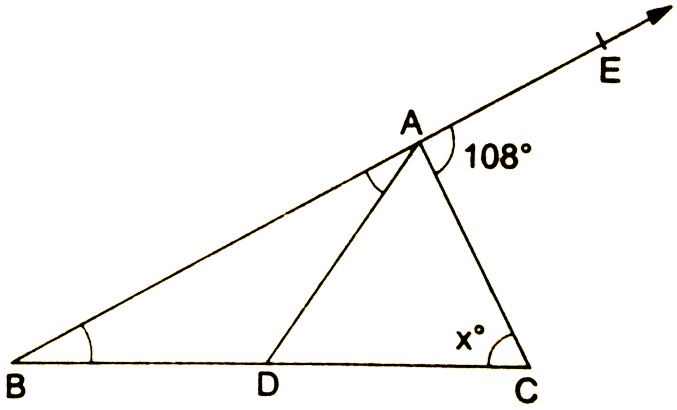
6. In the given figure, AD divides $\angle BAC$ in the ratio 1 : 3 and AD=DB. Determine the value of x.



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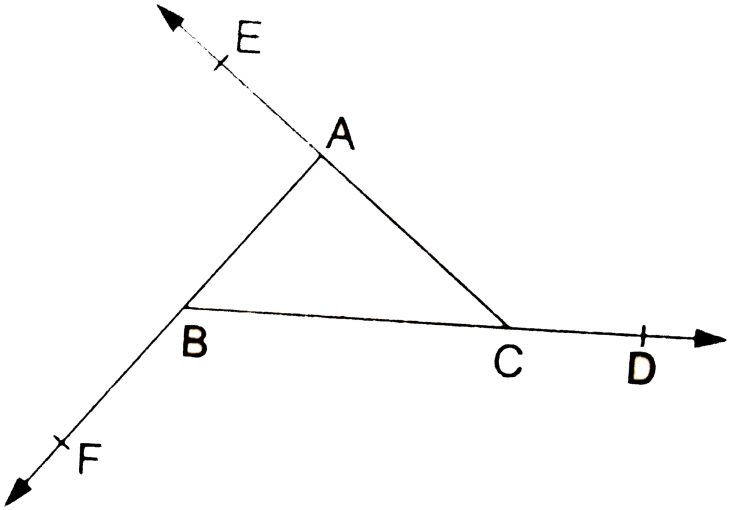
7. If the sides of a triangle are produced in order, prove that the sum of the exterior angles so formed is equal to four right angles.



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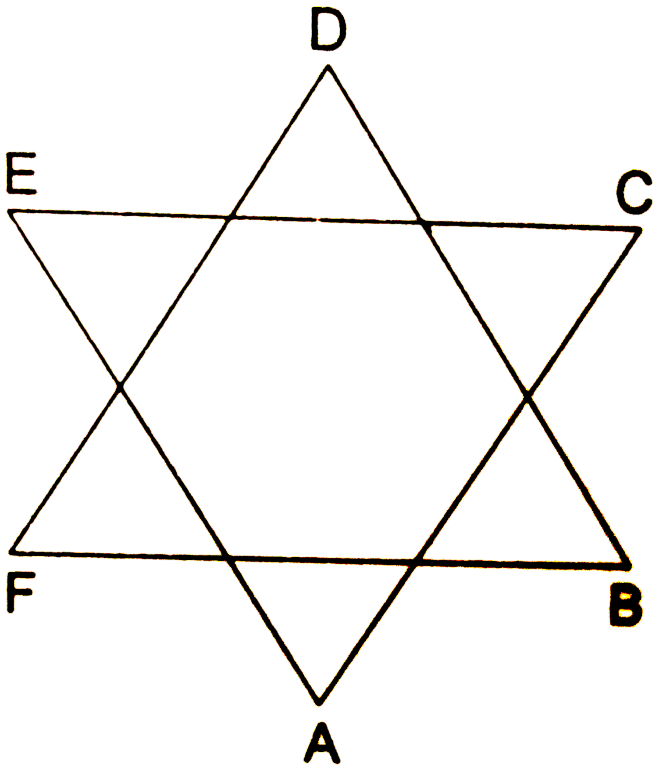
8. In the adjoining figure, show that

$\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = 360^\circ$



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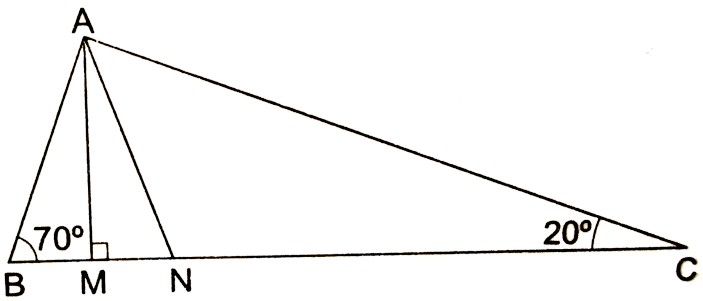
9. In the given figure, $AM \perp BC$ and AN is the bisector of $\angle A$. If $\angle ABC = 70^\circ$ and $\angle ACB = 20^\circ$, find $\angle MAN$.



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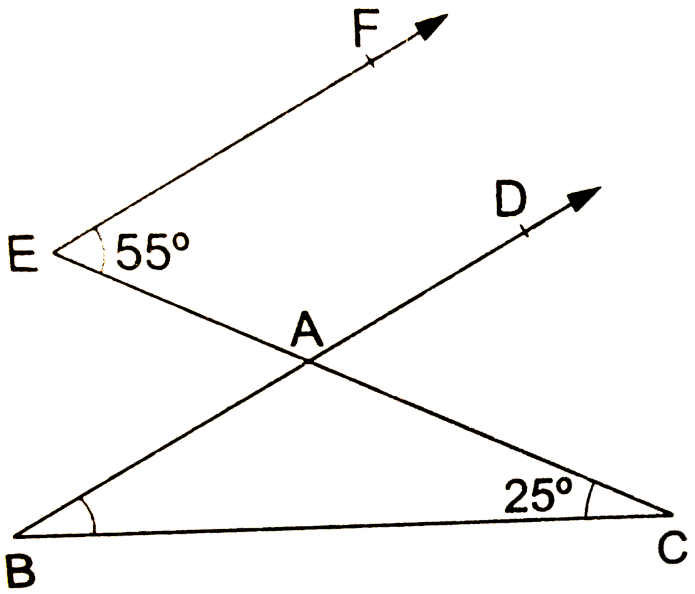
10. In the given figure, $BAD \| \| EF, \angle AEF = 55^\circ$ and $\angle ACB = 25^\circ$, find $\angle ABC$.



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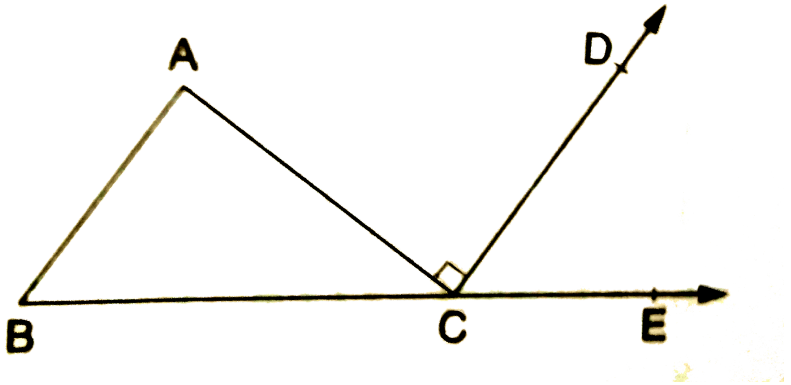
11. In a ΔABC, it is given that $\angle A : \angle B : \angle C = 3 : 2 : 1$ and $CD \perp AC$. Find $\angle ECD$



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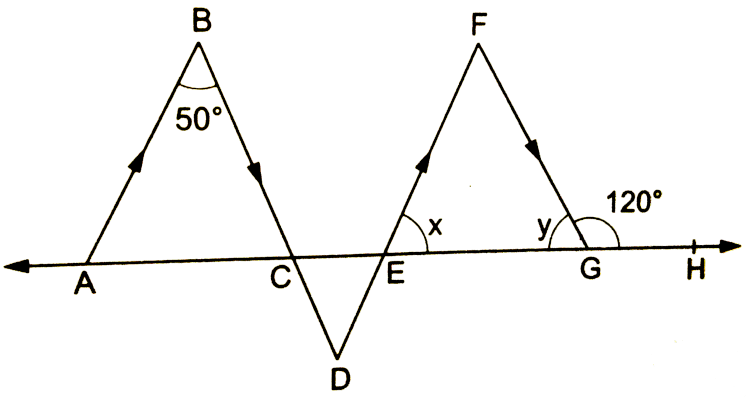
12. In the given figure, $AB||DE$ and $BD||FG$ such that $\angle ABC = 50^\circ$ and $\angle FGH = 120^\circ$. Find the values of x and y.



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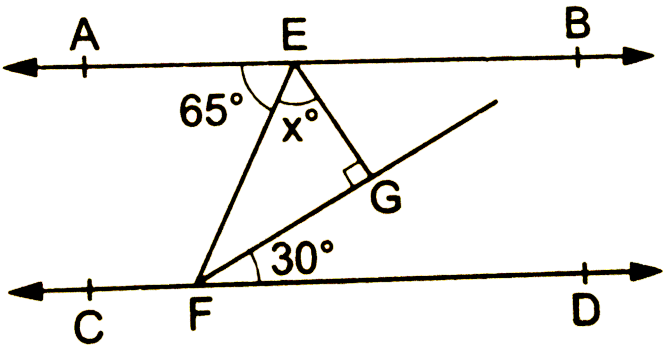
13. In the given figure, $AB \parallel CD$ and EF is a transversal. If $\angle AEF = 65^\circ, \angle DFG = 30^\circ, \angle EGF = 90^\circ$ and $\angle GEF = x^\circ$, find the value of x.



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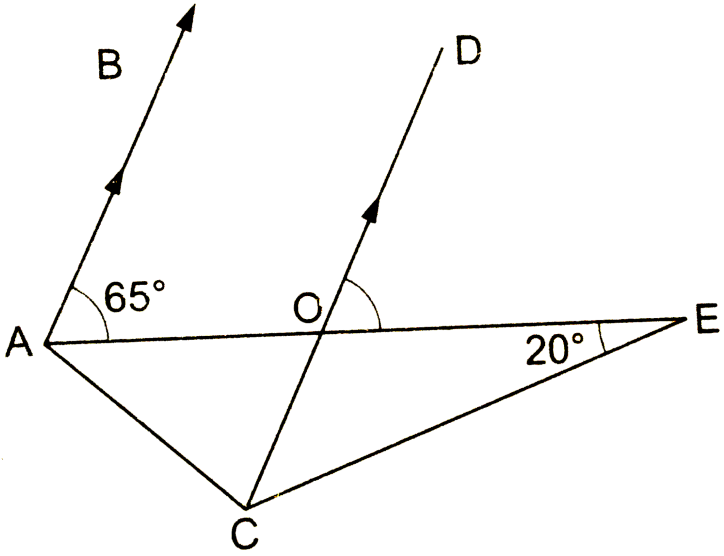
14. In the given figure, $AB \| CD, \angle BAE = 65^\circ$ and $\angle OEC = 20^\circ$. Find $\angle ECO$.



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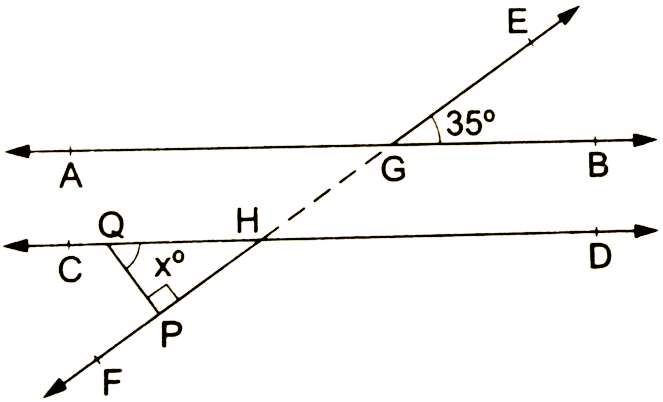
15. In the given figure, $AB \| CE$ and EF is a transversal, cutting them at G and H respectively. If $\angle EGB = 35^\circ$ and $QP \perp EF$, find the

measure of $\angle PQH$.



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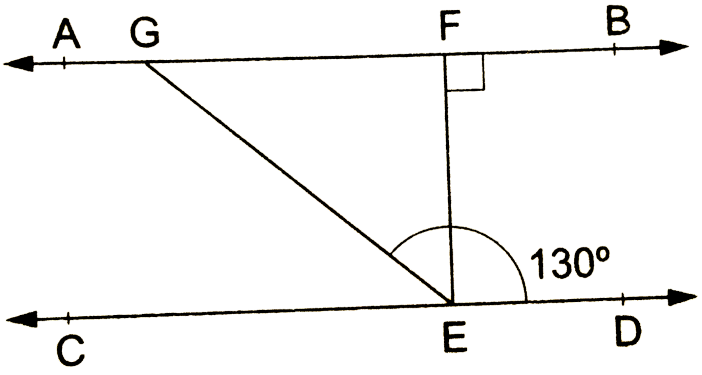
16. In the given figure, $AB \parallel CD$ and $EF \perp AB$. If EG is the transversal such that $\angle GED = 130^\circ$, find $\angle EGF$.



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Multiple Choice Questions Mcq

1. In a ΔABC, if $3\angle A = 4\angle B = 6\angle C$ then $A : B : C = ?$

A. $3 : 4 : 6$

B. $4 : 3 : 2$

C. $2 : 3 : 4$

D. $6 : 4 : 3$

Answer: B

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2. In a ΔABC, if $\angle A - \angle B = 42^\circ$ and $\angle B - \angle C = 21^\circ$ then $\angle B = ?$

A. 32°

B. 63°

C. 53°

D. 95°

Answer: C

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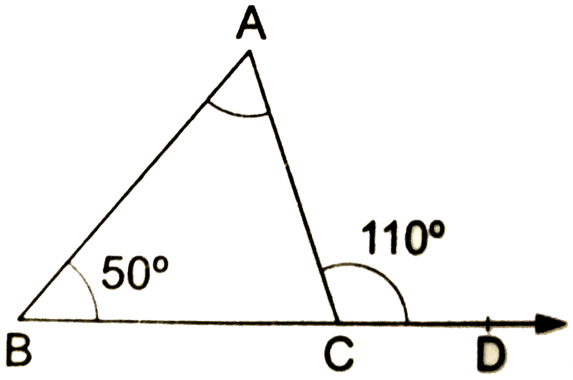
Multiple Choice Questions Mcq

1. In a ΔABC, side BC is produced to D. If $\angle ABC = 50^\circ$ and $\angle ACD = 110^\circ$ then $\angle A = ?$



A. 160°

B. 60°

C. 80°

D. 30°

Answer: B

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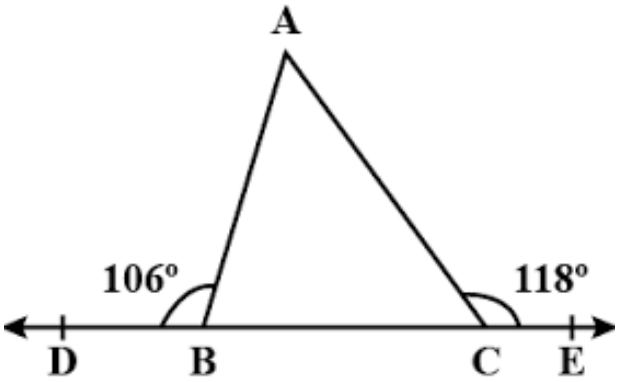
2. Side BC of ΔABC has been produced to D on left and to E on right-hand side of BC such that $\angle ABD = 106^\circ$ and $\angle ACE = 118^\circ$. Then, $\angle A = ?$



A. 44°

B. 55°

C. 65°

D. 75°

Answer: D

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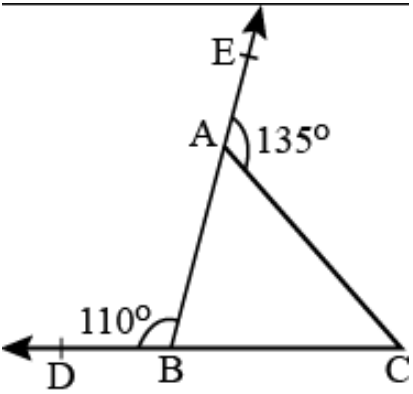
3. In the given figrue, the sides CB and BA of ΔABC have been produced to D and E respectively such that $\angle ABD = 110^\circ$ and $\angle CAE = 135^\circ$. Then, $\angle ACB = ?$



A. 65°

B. 45°

C. 55°

D. 35°

Answer: A

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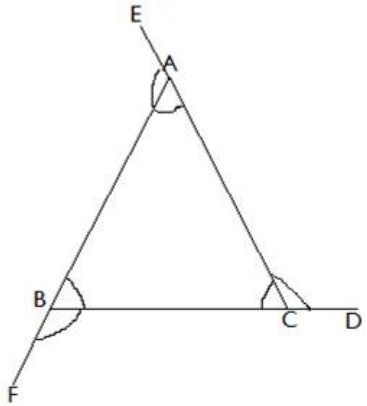
4. The side BC, CA and AB of ΔABC have been produced to D, E and F respectively. $\angle BAE + \angle CBF + \angle ACD = ?$



A. 240°

B. 300°

C. 320°

D. 360°

Answer: D

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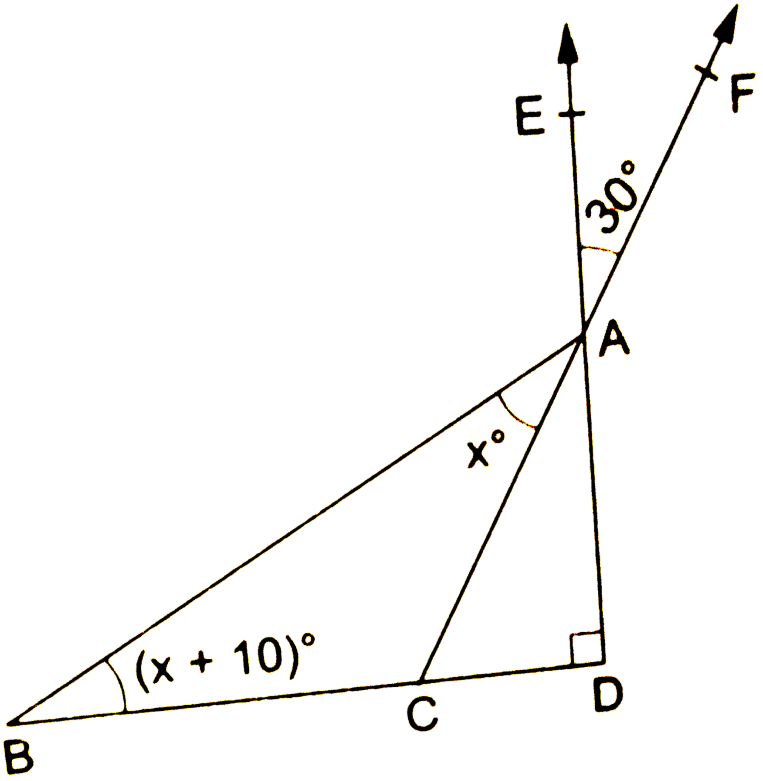
5. In the given figure, $EAD \perp BCD$. Ray FAC cuts ray EAD at a point A such that $\angle EAF = 30^\circ$. Also, in

$\Delta BAC, \angle BAC = x^\circ$ and $\angle ABC = (x + 10)^\circ$. Then the value of x is



A. 20

B. 25

C. 30

D. 35

Answer: B

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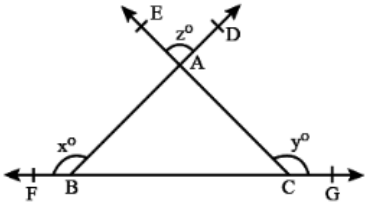
6. In the given figure, two rays BD and CE intersect at a point A. The side BC of ΔABC have been produced on both sides to points F and G respectively. If $\angle ABF = x^\circ, \angle ACG = y^\circ$ and $\angle DAE = z^\circ$ then $z = ?$



A. $x + y - 180$

B. $x + y + 180$

C. $180 - (x + y)$

D. $x + y + 360^\circ$

Answer: A

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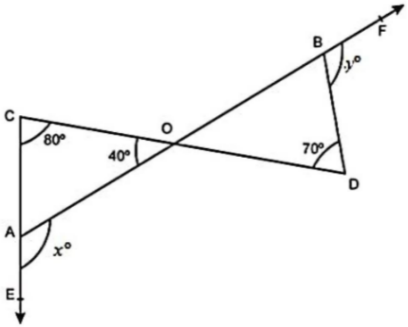
7. In the given figure, lines AB and CD intersect at a point O. The sides CA and OB have been produced to E and F respectively such that $\angle OAE = x^\circ$ and $\angle DBF = y^\circ$



If

$\angle OCA = 80^\circ, \angle COA = 40^\circ$ and $\angle BDO = 70^\circ$ then $x^\circ + y^\circ = ?$

A. 190°

B. 230°

C. 210°

D. 270°

Answer: B

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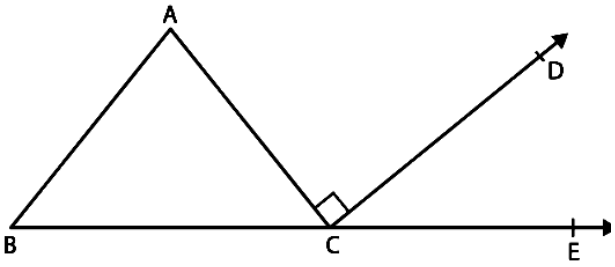
8. In a ΔABC it is given that $\angle A : \angle B : \angle C = 3 : 2 : 1$ and $\angle ACD = 90^\circ$

If BC is produced to E then $\angle ECD = ?$



A. 60°

B. 50°

C. 40°

D. 25°

Answer: A

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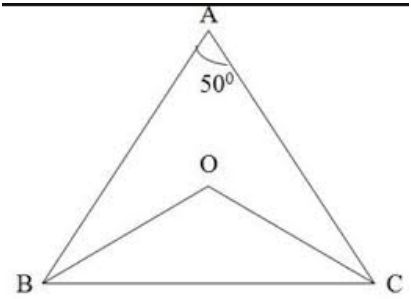
9. In the given figure, BO and CO are the bisectors of $\angle B$ and $\angle C$ respectively. If $\angle A = 50^\circ$ then $\angle BOC = ?$



A. 130°

B. 100°

C. 115°

D. 120°

Answer: C

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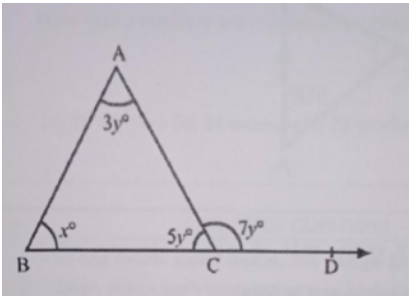
10. Side BC of ΔABC has been produced to a point D. If $\angle A = 3y^\circ, \angle B = x^\circ, \angle C = 5y^\circ$ and $\angle ACD = 7y^\circ$. Then, the value

of x is



A. 60

B. 50

C. 45

D. 35

Answer: A

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