MATHS

BOOKS - NAGEEN PRAKASHAN ENGLISH

LINES AND ANGLES

Solved Examples

1. Find the measure of an angle which is 32° more than its complement.

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2. The supplement of an angle is 10° more than three times its complement. Find the angle.

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3. Fin the measure of the completement of an angle of $37^\circ 42' 34'$

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4. Angles A and B are complementary and the measure of angle A is twice the measure of angle B. Find the measures of angles A and B

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5. If x° is the measure of an angle which is equal to its completment and y° is the measure of an angle which is equal to its supplement, then find $\frac{x^\circ}{y^\circ}$

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6. Find the values of a and b from the adjoining figure.

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7. x and y from a linear pair of two adjactent angles. If $y = 3x - 12^\circ$, find the values of x and y

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8. Find the values of a and b from the adjoining figure. When

$a - b = 4^\circ$

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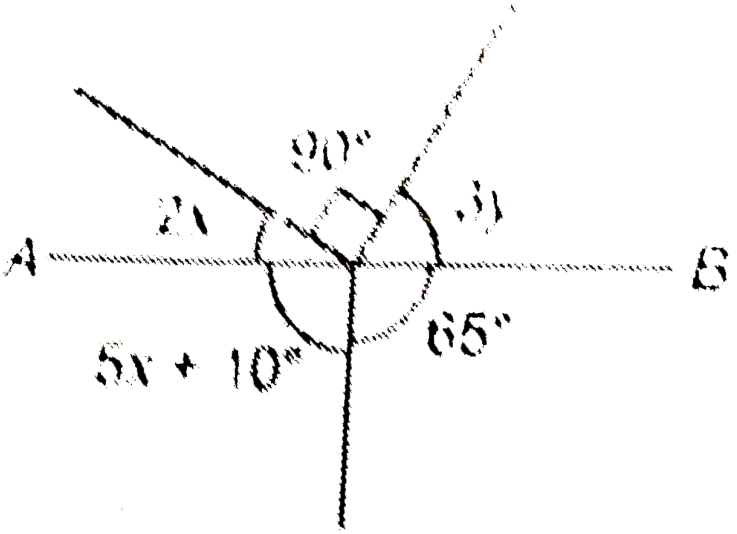
9. In the adjoining figure, find the values of x and y, Given that AOB is a straight line.



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10. In Figure, $AB \mid\mid CD$. Find the value of x

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11. The given figure shows that two parallel lines cut by the transversal AB. If $\angle a : \angle b = 4 : 5$, find the angles a,b,c,d,e and x.

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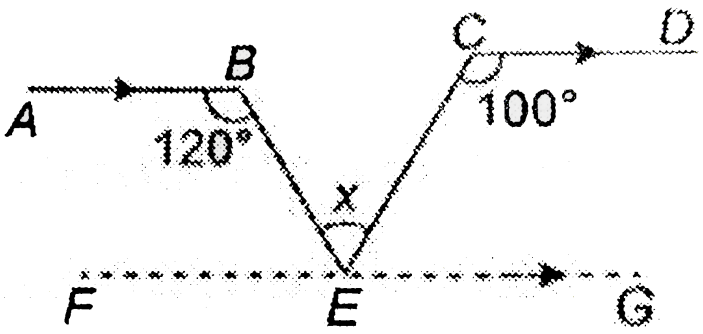
12. In Figure, $AB \mid\mid CD$. Find the value of x



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13. In the following figure , AB||CD . Find $\angle PQR$ and reflex aangle PQR

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14. Prove that if the two arms of an angle are parallel to the two arms of another angle, then the angles are either equal or supplementary.

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15. If the bisectors of a pair of corresponding angles formed by a transversal with two given lines are parallel;prove that the given lines are parallel.

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16. If two parallel lines intersected by a transversal; prove that the bisectors of the two pairs of interior angle encloses a rectangle.

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17. If in a ΔABC, $\angle A = 45^\circ$, $\angle B = 75^\circ$, then

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18. In a triangle ABC, $6\angle A = 4\angle B = 3\angle C$. Then the smallest angle in the ΔABC is

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19. Find x° from the given figure.

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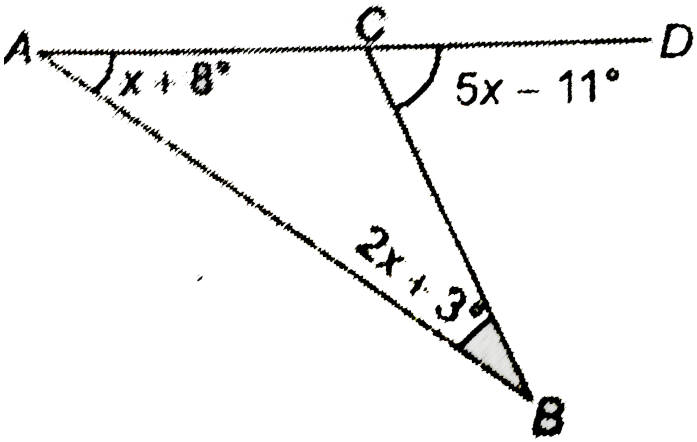
20. In the given figure $\angle A = x + 8^\circ, \angle B = 2x + 3^\circ$ and $\angle BCD = 5x - 11^\circ$, find the measure of $\angle BCD$



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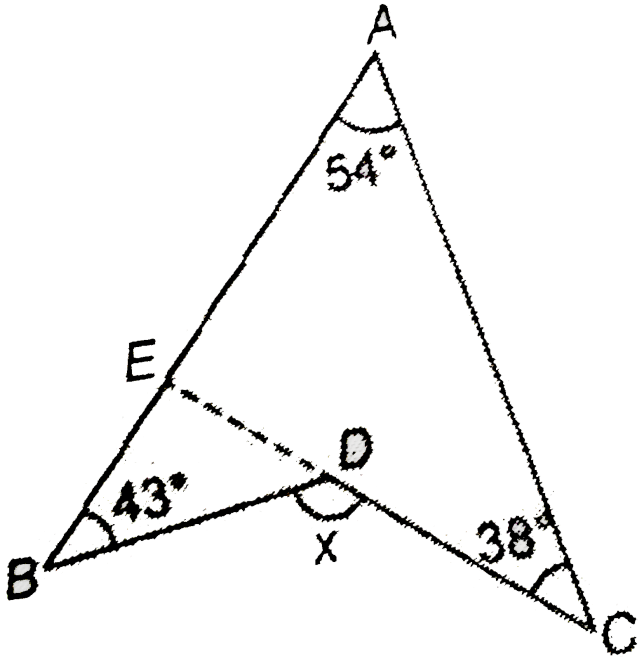
21. In the adjoining figure find $\angle x$



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22. In the adjoining figure find $\angle x$

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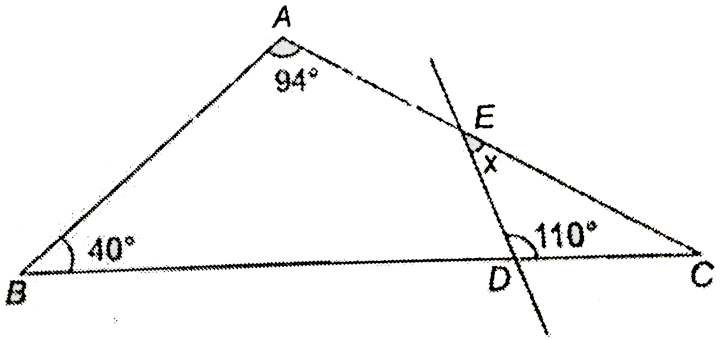
23. Find the measure of $\angle x$ in the adjoining figure.



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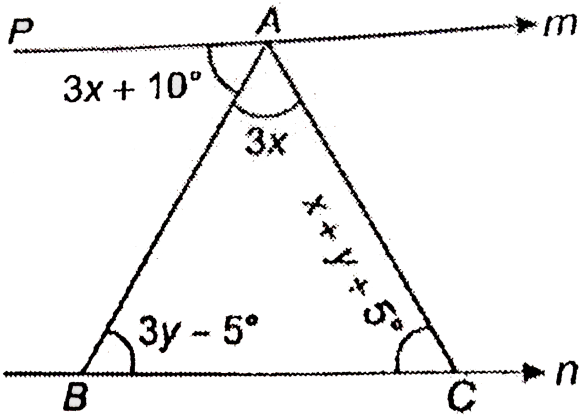
24. In the given figure, line m is parallel to n. Given that

$\angle BAP = 3x + 10^\circ, \angle BAC = 3x$

$\angle ABC = 3y - 5^\circ, \angle ACB = x + y + 5^\circ$

Find the valuses of x and y



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25. In ΔABC, bisectors of $\angle B$ and $\angle C$ interesct each other at point O. Prove that $\angle BOC = 90^\circ + \frac{1}{2}\angle Ai.e., \angle 1 = 90^\circ + \frac{1}{2}$A

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26. The sides AB and AC of ABC are product to P and Q respectively. the bisectors of exterior angles at B and C of ABC meet at O (fig.19) prove that $\angle BOC = 90^0 - \frac{1}{2}\angle A$

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Problems From Ncert Exemplar

1. In Fig. 6.16, if $x + y = w + z$, then prove that AOB is a line.

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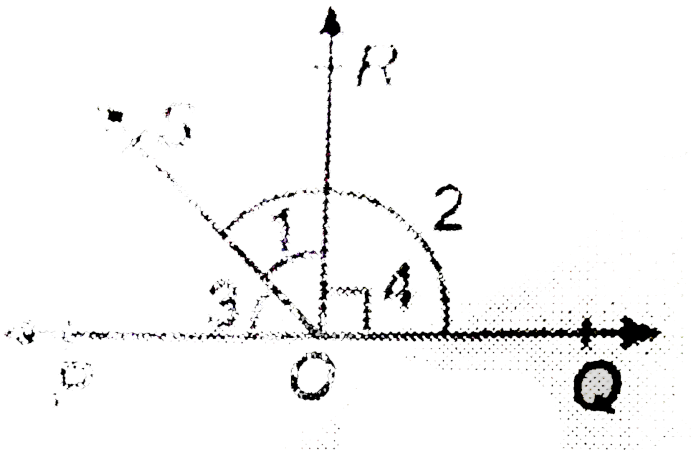
2. In figure POQ is a line. Raw Oris perpendicular to line PQ .OS is another ray lying between rays OP and OR. Prove that

$\angle ROS\frac{1}{2}(\angle QOS - \angle POS) i.\ e.\ , \angle 1 = \frac{1}{2}(\angle 2 - \angle 3)$



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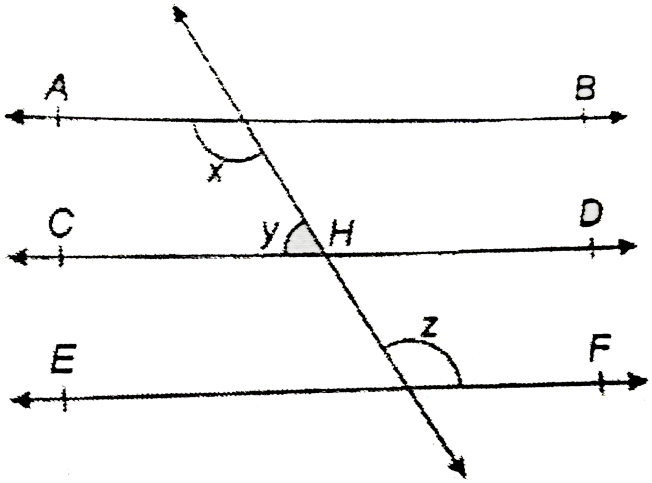
3. In figure if AB||CD,CD||EF and y: z=3: 7, find x.



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4. In Figure, $PQ\ and\ RS$ are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS and C and again reflects back along CD. Prove that $AB \mid\ \mid CD$.

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5. In Fig. 6.44, the side QR of PQR is produced to a point S. If the bisectors of $\angle PQR\backslash\ \ and \angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2}\angle QPR$.

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6. A Δ ABC is right angled at A. L is a point on BC such that AL $\perp$ BC. Prove that $\angle BAL = \angle ACB$.

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Exercise 6 A

1. Two angles are in the ratio $4:5$ Find the angles if they are (i) complementary (ii) supplementary to each other.

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2. The complement of and angles is $\frac{1}{4}th$ of the a right . Find the angle.

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3. Find the angle which is 60° more than it complement.

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4. Find the angle which is equal to its supplement

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5. If the supplement of an angle is three times its complement, find the angle.

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6. Find the supplement of $28^\circ 35'$

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7. Find the supplement of $81^\circ 30' 43'$

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8. If the angles $(2a - 30^\circ)$ and $(b + 60^\circ)$ make a linear pair, find the values of a and b when $a - b = 30^\circ$

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9. Two adjacent angles on a straight line are $(5x - 6)^\circ$ and $7(x + 6)^\circ$. Find the value of x and

magenitude of both the angles.

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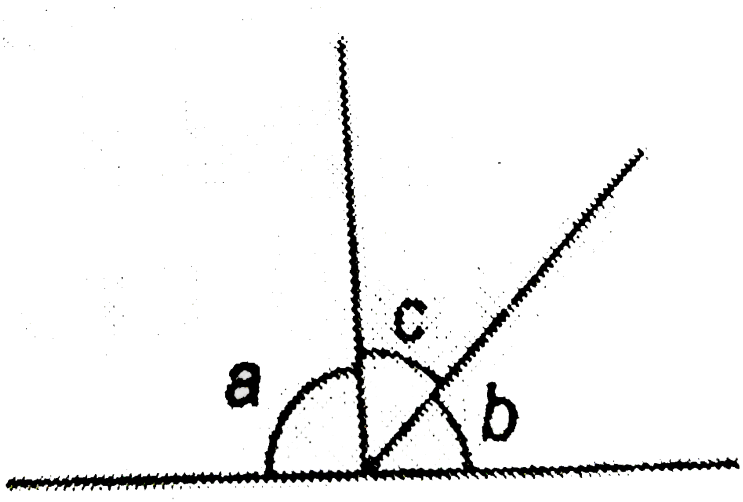
10. In the given figure if c=3b and a=5b find the value of a and b



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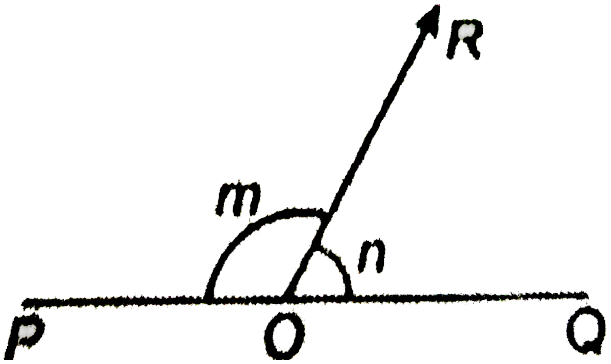
11. In the adjoining figure, POQ is a straight line. Find the m and n when

(i) $m - n = 60^\circ$

(ii) $m : n = 7.5$



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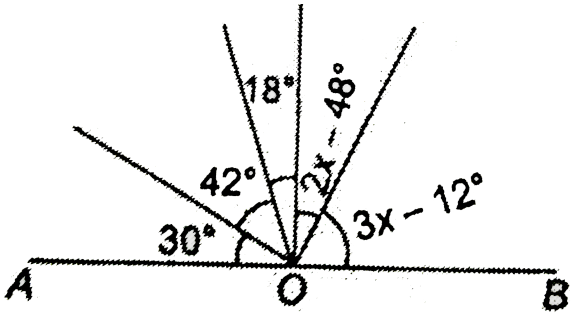
12. Find the value of x if AOB is a straight line



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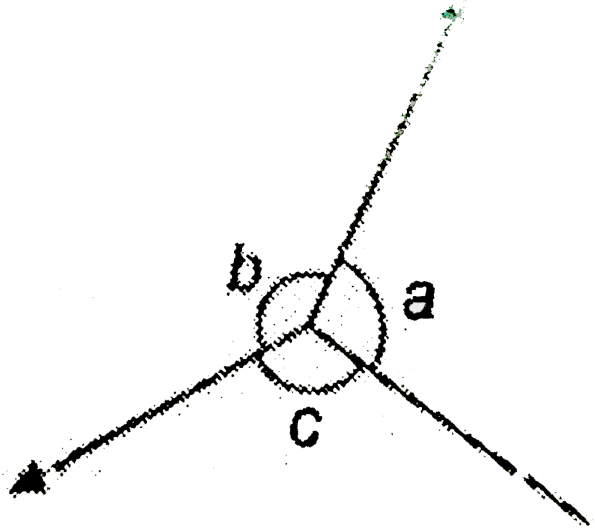
13. If $a:b:c=2:3:4,$ find a,b and c



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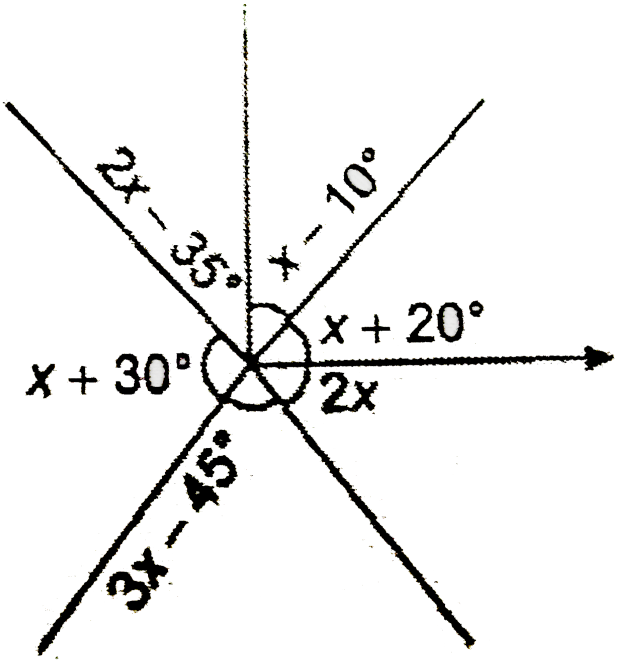
14. Find the value of x.



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15. Show that the bisectors of two adjacent supplementary angles include a right angle

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16. Find the measure of an angle if five times of its completement is 24° less than twice of its supplement.

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17. Find the complement of the angle $(150 - a + b)^\circ$

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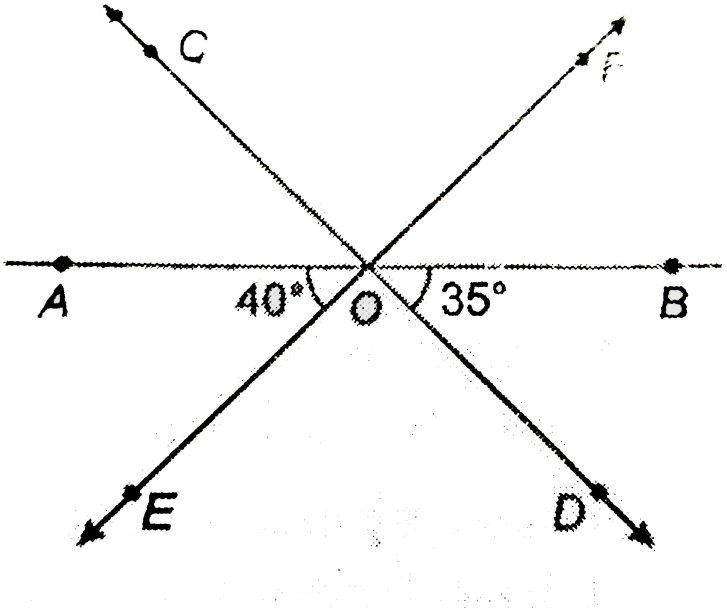
18. In the given figure, find the measures of $\angle AOC, \angle COF, \angle DOE$ and $\angle BOF$.



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19. Prove that the bisectors of a pair of vertically opposite angles are in the same straight line.

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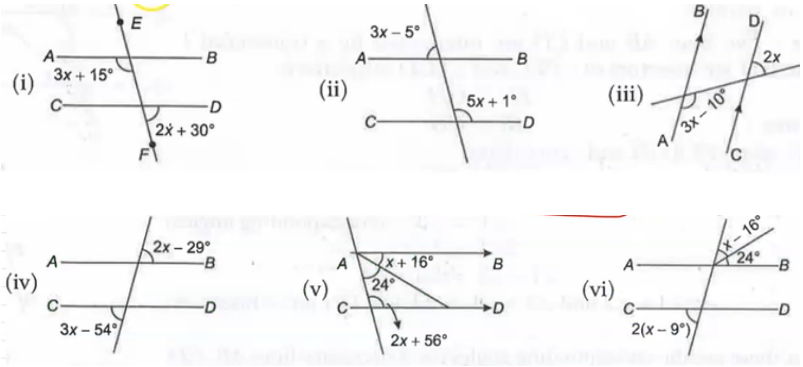
Exercise 6 B

1. If AB ||CD in each of the following find x



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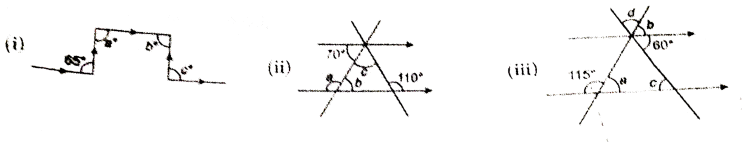
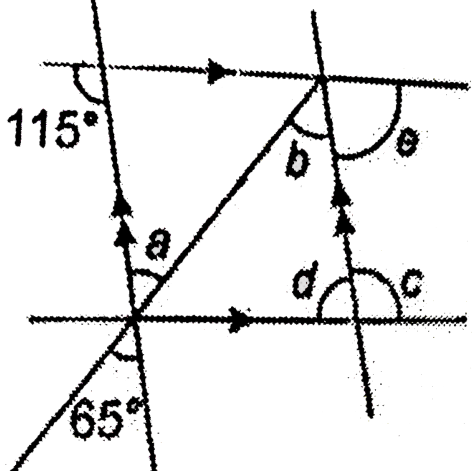
2. Find giving reasons, the measres of angles a,b,c,d and e.



(iv)



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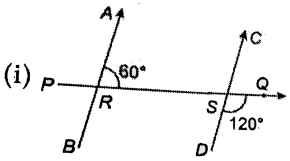
3. State giving reason whether AB||CD

(i)



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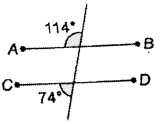

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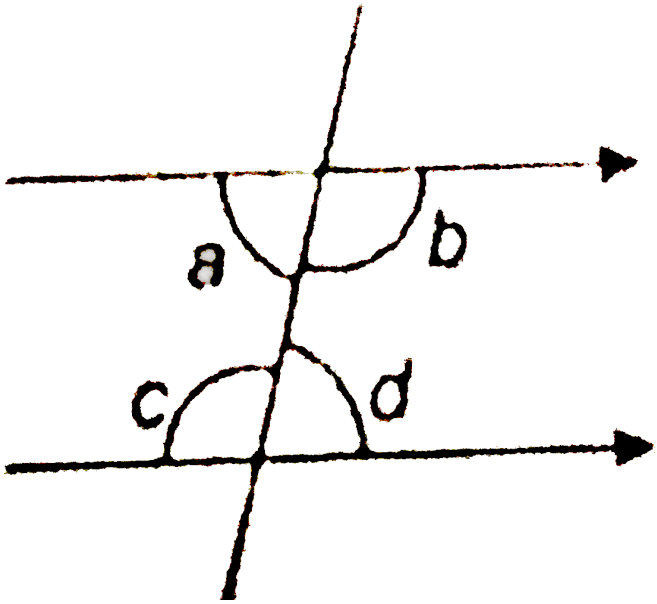
4. If $a : b = 4 : 5$, find the angles c and d



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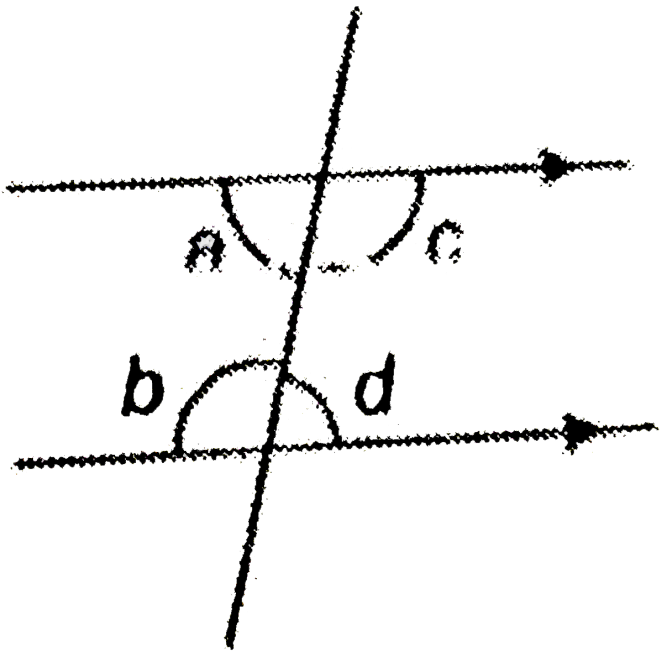
5. If $a : b = 1 : 2$, find the angle c and b



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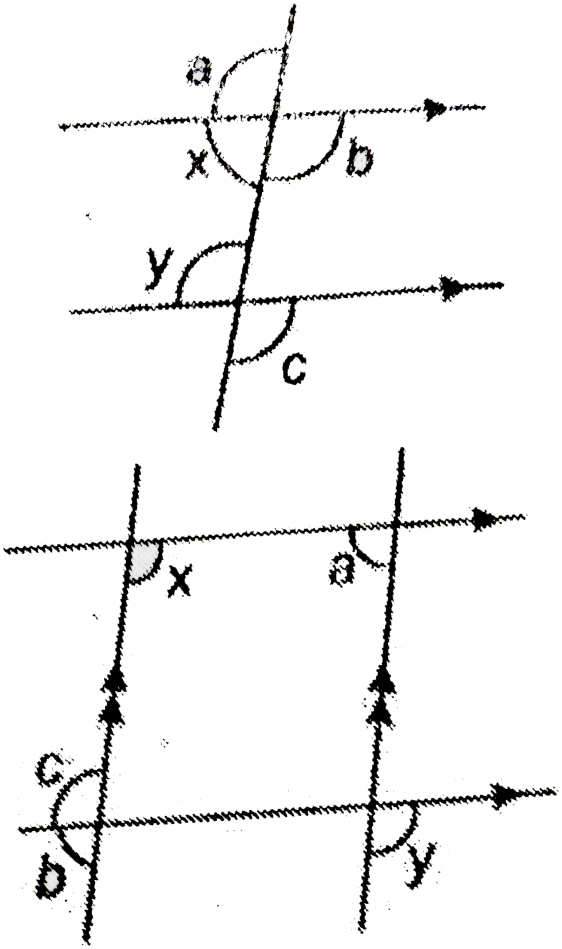
6. In each case given below find the the vlues of x and y then angles represented by a, b and c,

(i) Given $x : y = 7 : 11$

(ii) Given $x + y = 240^\circ$



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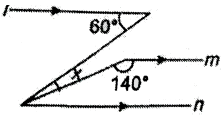
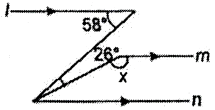
7. In the following figure , l||m||n. Find x in each case.

(i)



(ii)



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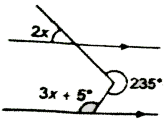
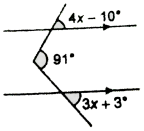
8. In each case given below find the value of x.

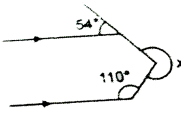
(i)



(ii)



(iii)



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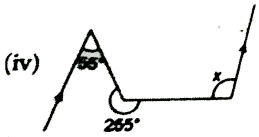

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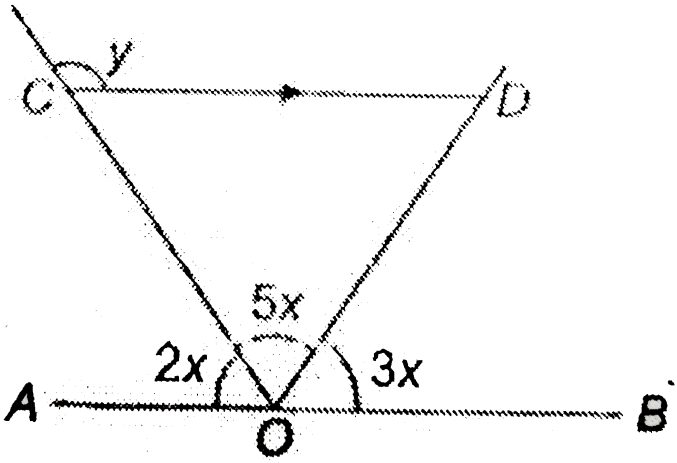
9. In the adjoining figure AB||CD, find x and y



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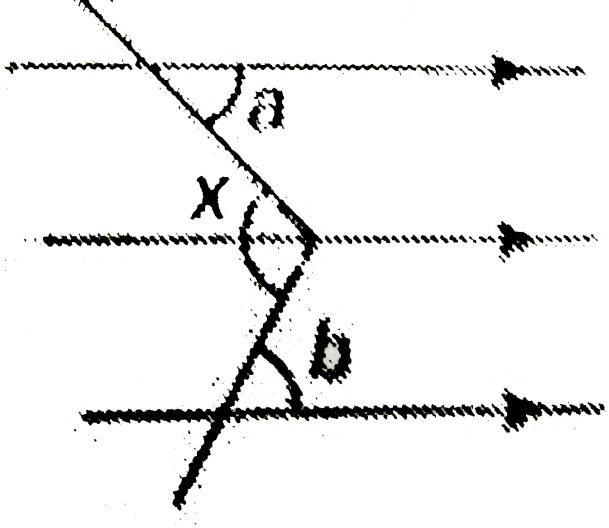
10. Giving reason show that

$\angle x = \angle a + \angle b$



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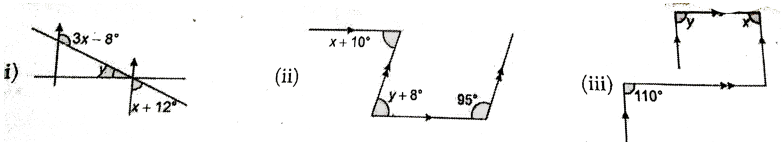
11. In each of the following figures, find the values of x and y



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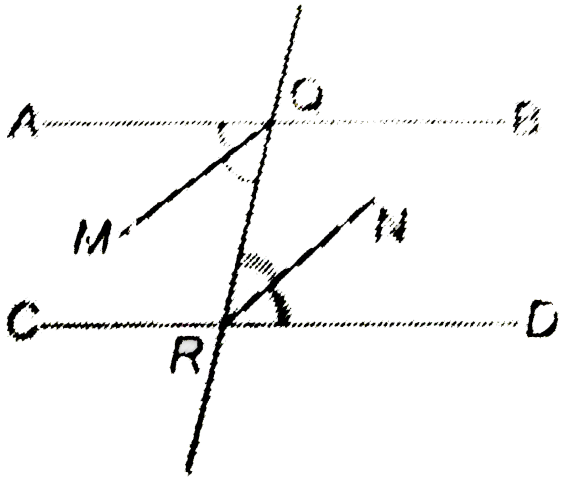
12. In the following figure, AB||CD, QM and RN are bisectors of alternate angles AQR and QRD respectively. Show that QM||RN.



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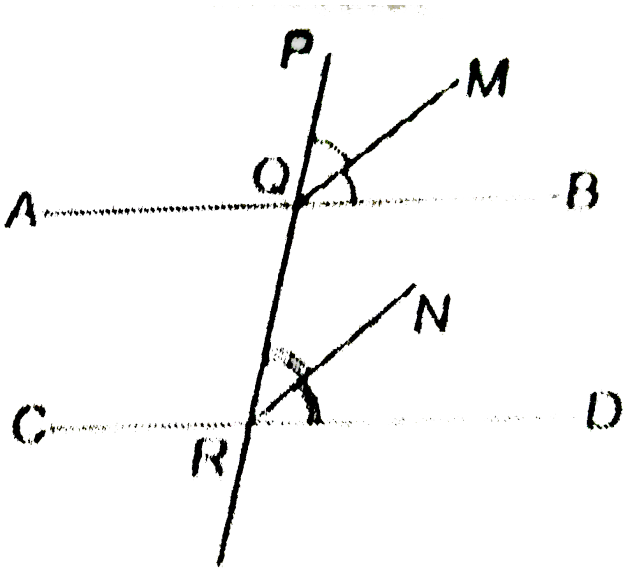
13. In the following figure AB||CD,QM and RN are bisectors of corresponding angles PQB and QRD respectively. Show that

QM ||RN



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14. Two straight lines are cut by a transversal. If the bisectors of a pair of co-interior angles are perpendicular to each other , prove the two straight lines are parallel to each other.

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15. In a parallelogram; the bisectors of any two consecutive angles intersect at right angle.

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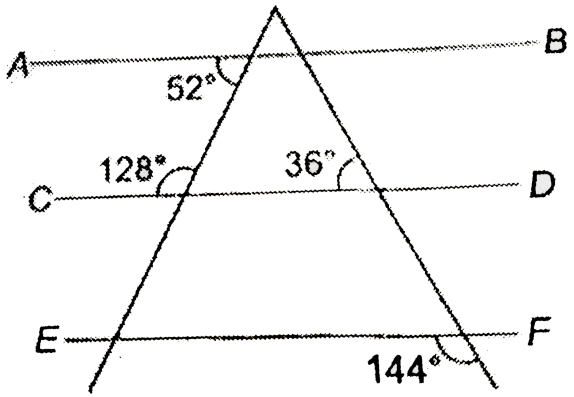
16. State giving reason whether AB, CD and EF are parallel



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Exercise 6 C

1. Angles of a triangle are $(3x)^\circ, (2x-7)$ and $(4x-11)^\circ$.

Find the measure of x and each angle of the triangle

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2. Prove that measure of each angle of an equilateral triangle is 60^0.

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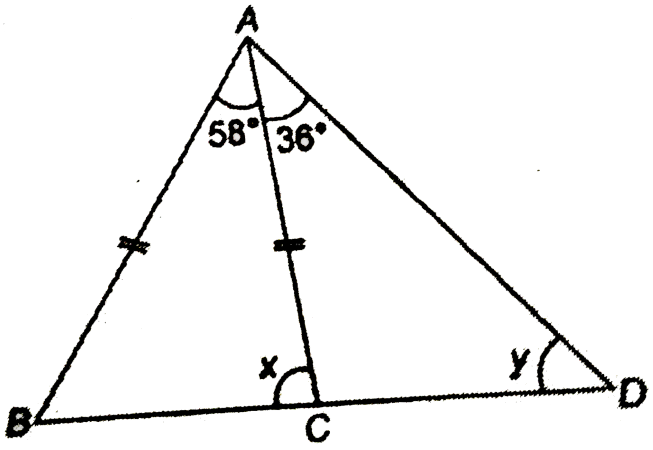
3. Find the x and y from the adjooining figure.



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4. In a $\Delta ABC, \angle A = 2\angle B = 3\angle C,$ find each of the triangle.

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5. In $\Delta ABC, \angle A = x + 15^\circ, \angle B = x$ and $\angle C = 2x - 35^\circ$ find, each angle of the triangle.

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6. In ΔABC, bisectors of $\angle B$ and $\angle C$ interesct each other at point O. Prove that $\angle BOC = 90^\circ + \frac{1}{2}\angle A i.e., \angle 1 = 90^\circ + \frac{1}{2}$

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7. An angle of a triangle mesures 68° and the other two angles differ by 16°. Find the angles.

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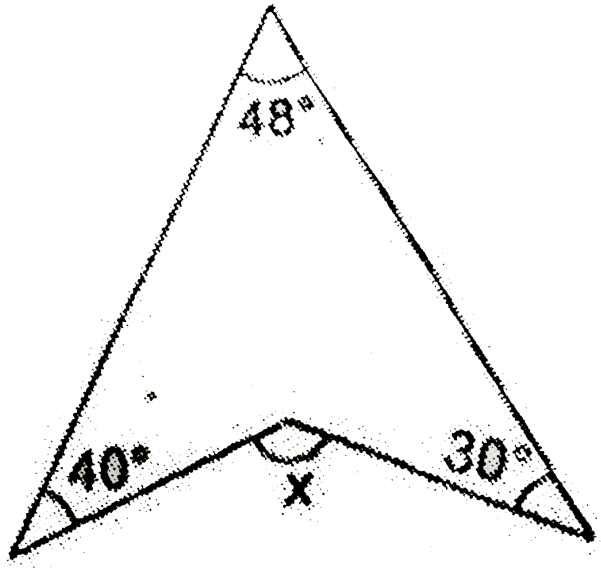
8. Find the value of x form the adjoining diagram.



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9. In ΔABC sides AB and C are produced to D and E respectively. Bisectors of exterior angles so formed interest

each other at point I. If $\angle BAC = 80^\circ$ and $\angle ACB = 50^\circ$

Find,

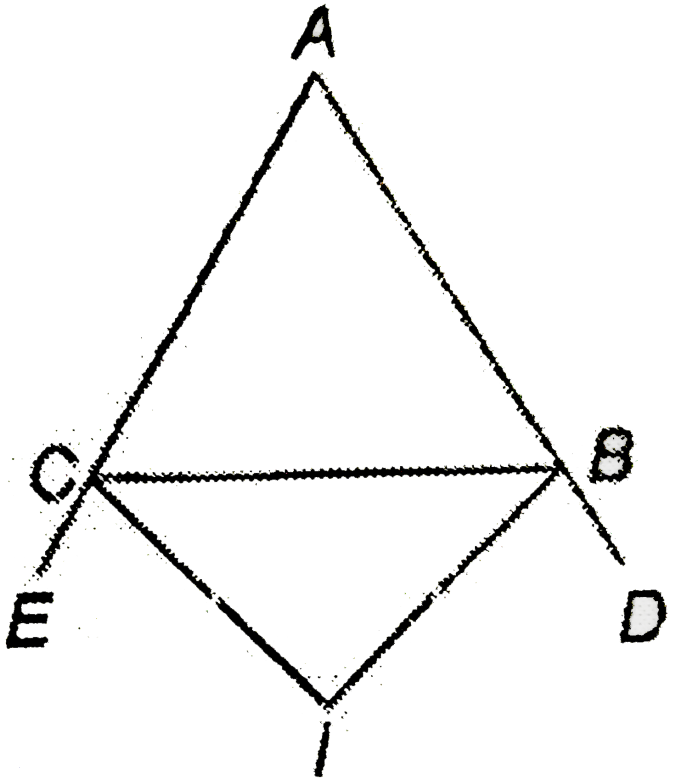
(i)$\angle ECB$

(ii) $\angle DBC$

(iii) $\angle ICB$

(iv) $\angle IBC$

(v) $\angle BIC$



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10. In triangle ABC,the bisector of interior angle A and the bisector angle C meet at point O. Prove that $\angle AOC = \frac{1}{2}\angle B$

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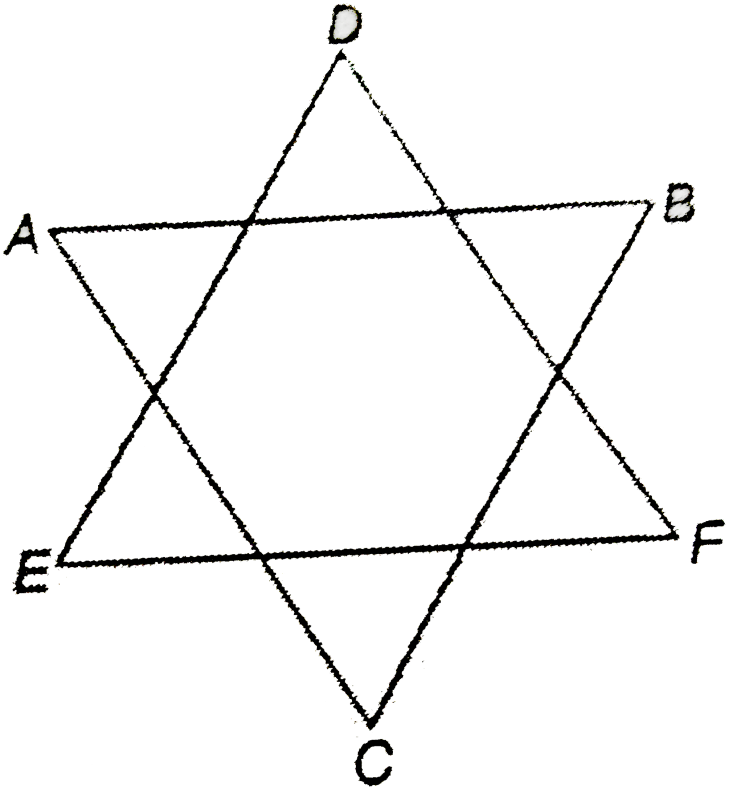
11. From the adjoining figure prove that $\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = 360^\circ$



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12. The side BC of ΔABC is product to N. bisector of angle meets BC at M. Prove that $\angle ABC + \angle ACN = 2\angle AMC$

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13. Bisectors of angles A and B of a parallelogram ABCD meet at point M. Prove that $\angle AMB = \frac{1}{2}(\angle C + \angle D)$

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14. Prove that bisectors of any two adjacent angles of a rhombus form a right angled triangle with common arm of the angles.

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15. Triangle ABC is right angles at B. Internet bisectors of acute angles A and C meet at point I. Find the measure of angle AIC

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16. Bisectors of angles A and D of a quadrilateral ABCD meet at P. Prove that $\angle APD = \frac{1}{2}(\angle B + \angle C)$

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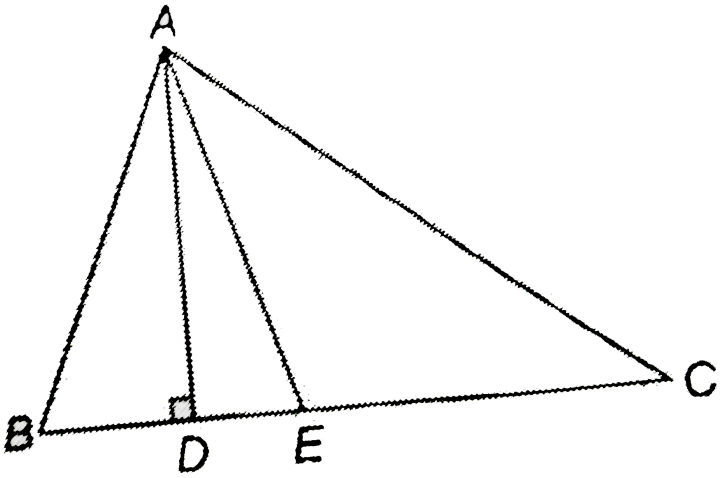
17. In the given figure, AD is altitude and AE is bisector of angle BAC of ΔABC. Show that $\Delta DAE = \frac{1}{2}(\angle B - \angle C)$



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18. In $\Delta ABC, \angle A - \angle B = 16^\circ$ and $\angle C - \angle A = 34^\circ = 34^\circ$, find all angles of the triangle

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19. In a right angled triangle ABC, $\angle B = 90^\circ$, p is a point on BA produced and Q is a point on BC produced. Find the the value of $\angle PAC + \angle QCA$

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20. In the adjoining figure, AB||CD. If the $\angle BAE = 25^\circ$ and $\angle CDE = 30^\circ$, then find $\angle AED$

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Revision Exercise Very Short Answer Questions

1. COMPLEMENTARY ANGLES If the sum of the measures of two angles is 90° then the angles are called complementary angles and each is called a complement of the other.

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2. SUPPLEMENTARY ANGLES Two angles are said to be supplementary angles if the sum of their measures is 180° and each of them is called a supplement of the other.

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3. Find the complement of 48°

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4. Find the complement of $37^\circ 30'$

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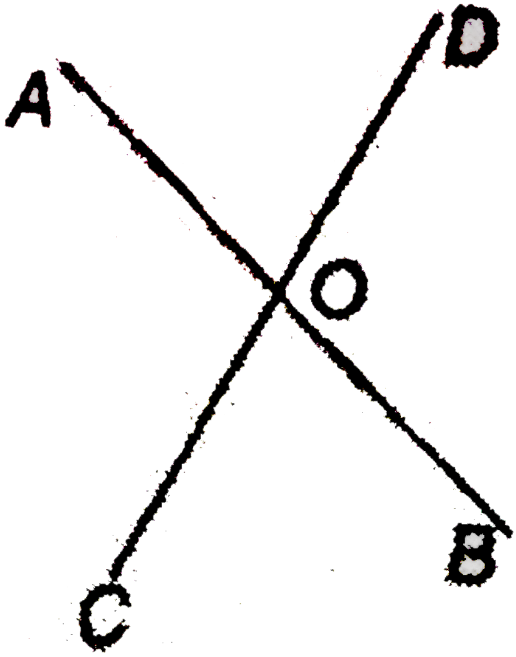
5. In the given figure if find, $\angle AOC = 45^\circ$, find $\angle BOD$



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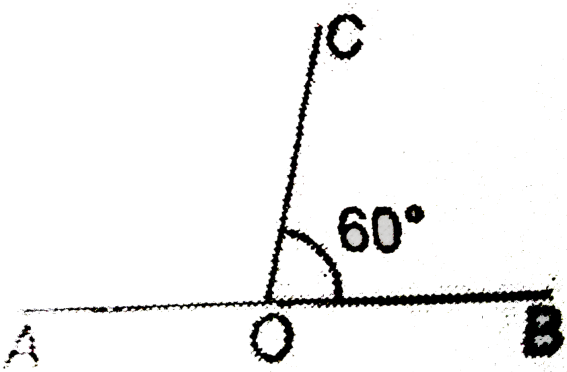
6. In the given, figure find the $\angle COA$.



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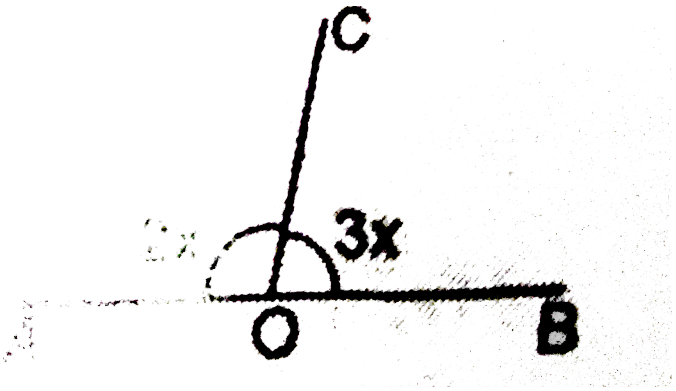
7. In the given ,figure find the value of x .



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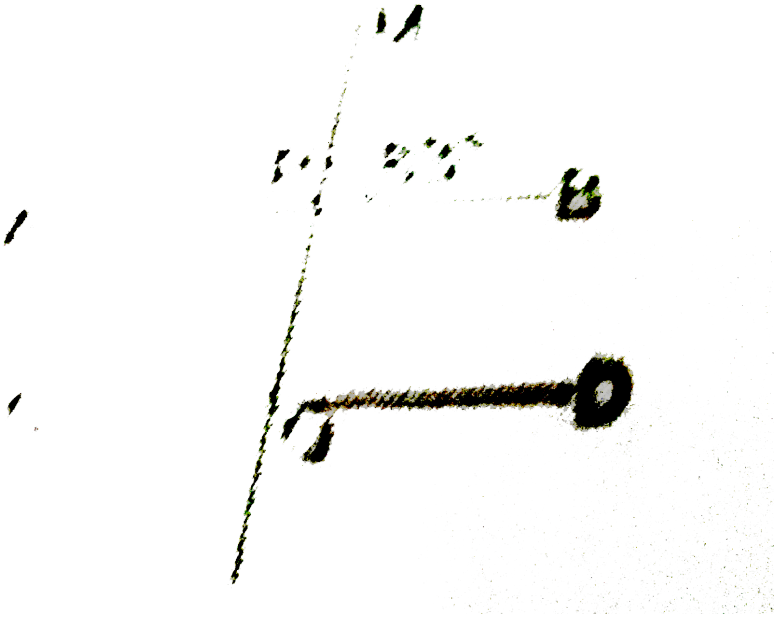
8. In the given figure if AB|| CD find $\angle APM$ and PQD



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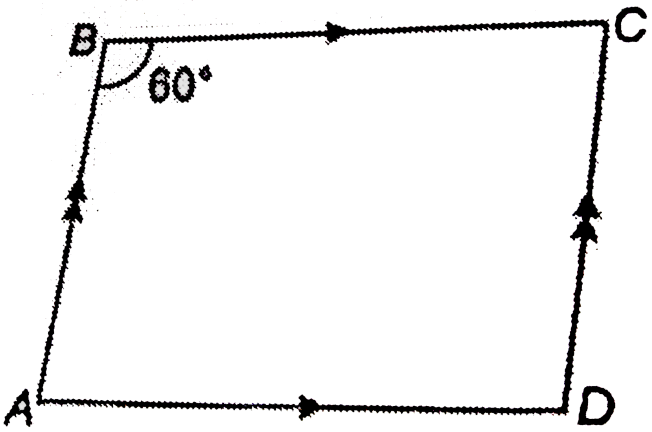
9. In the figure if AB || CD and AD||BC, find $\angle A$ and $\angle D$



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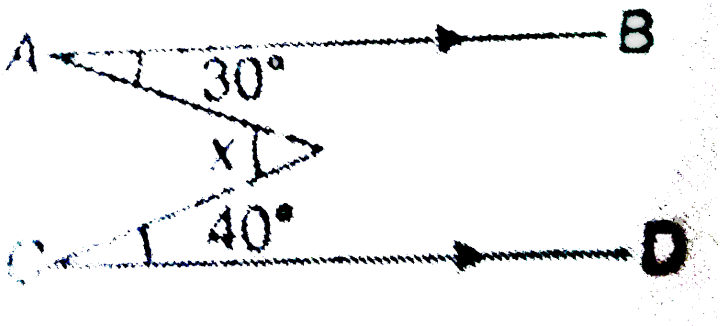
10. In the following figure if AB||CD, find the value of x.



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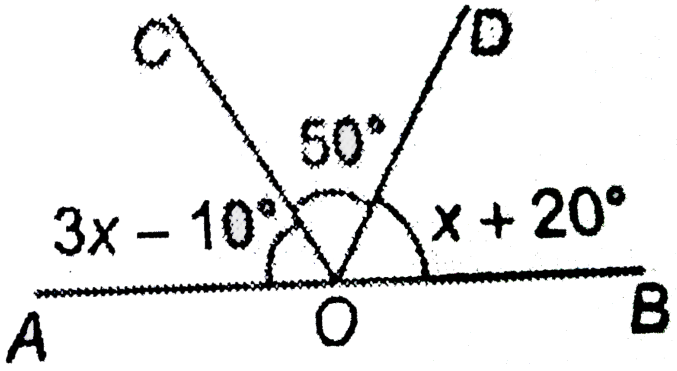
Revision Exercise Short Answer Questions

1. In the given firgue, AOB is a straight line if $\angle AOC = (3x - 10)^\circ \angle COD = 50^\circ$ and $\angle BOd = (x + 80)^\circ$ find $\angle AOC$



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2. Find the measure of an angle, if six times its complement is 12° less than twice of its supplement

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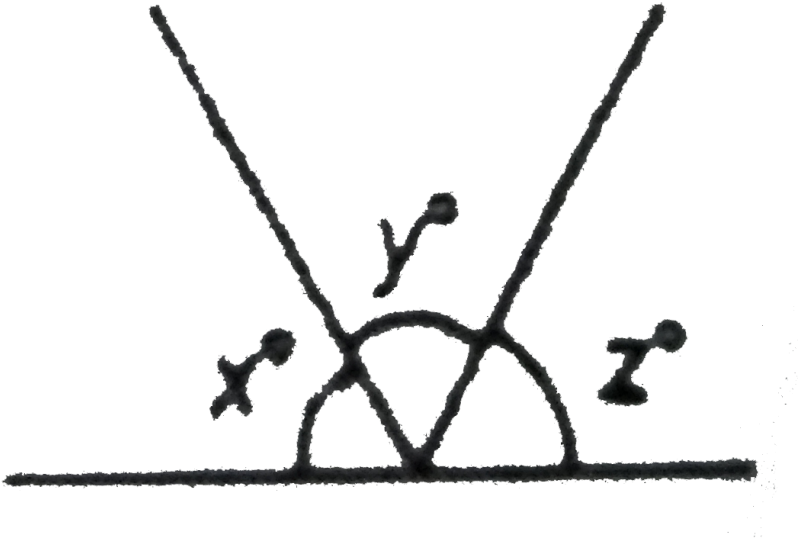
3. In the adjoining figue if AOB is a straight line and if $x : y : z = 4 : 5 : 6$, find $\angle x, \angle$ and $\angle z$



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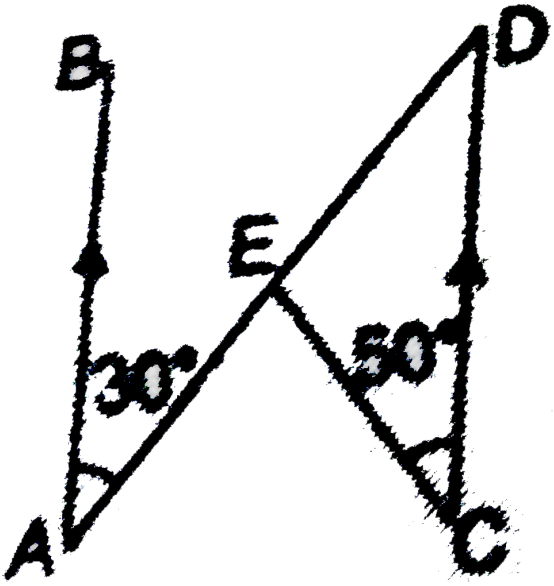
4. In the given figreu $AB \| CD, \angle BAD = 30^\circ$ and $\angle ECD = 50^\circ$, find $\angle CED$



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5. Two unequal angles of a parallelogram are in the ratio $2:3$. Find all its angles in degrees.

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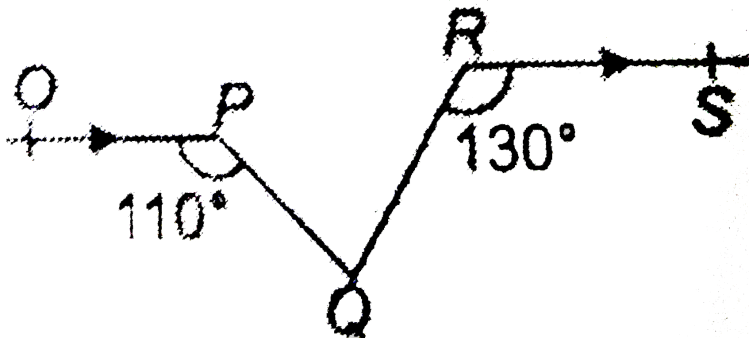
6. In the figure OP||RS. Determine $\angle PQR$



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7. Prove that the bisectorsof pair of vertically opposite angles are in the same straight line.

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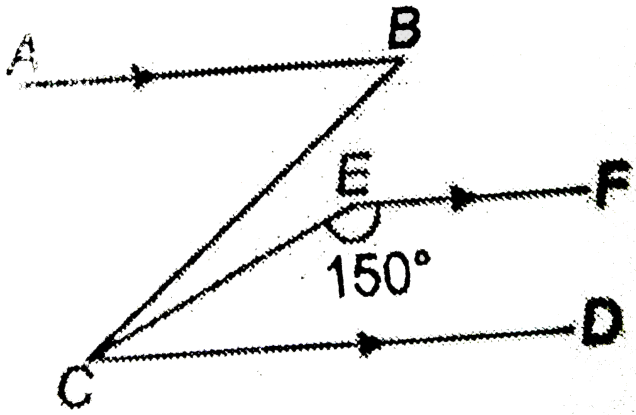
8. In the figure if EC is the bisector of $\angle BCD$ and $AB||CD||EF$. Find $\angle ABC$



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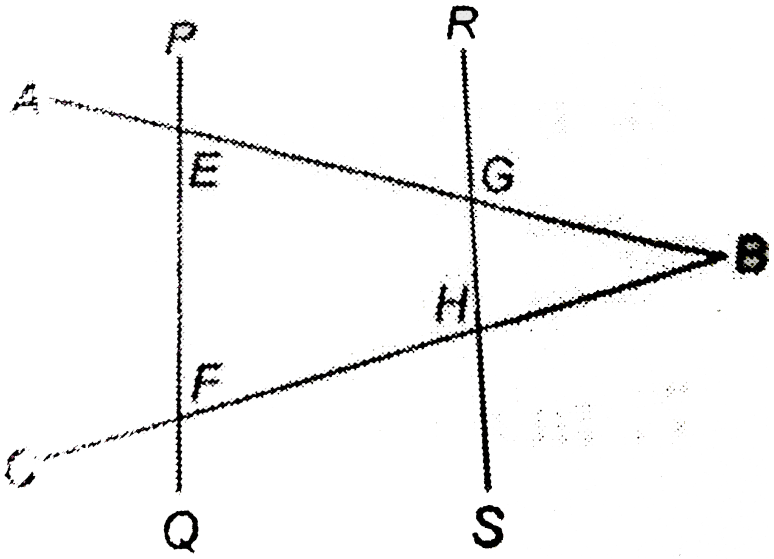
9. In the given figure $PQ \| \| RS, \angle AEF = 95^\circ, \angle BHS = 110^\circ$ and $\angle ABC = x^\circ$

. Find the valueof x.



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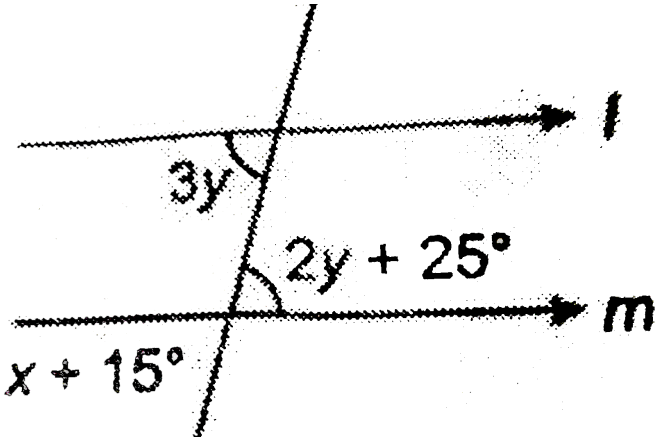
10. In the given figure if l||m, what is the value of x.



A. 60

B. 50

C. 45

D. 30

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11. ΔABC , $\angle A + \angle B = 65^\circ$, $\angle B + \angle C = 140^\circ$,then $\angle B$ is equal to

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

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Revision Exercise Long Answer Questions

1. If two parallel lines are ineresected by a transversal prove that the bisectores fo two pairs of interior angles enclose a rectangle.

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2. The side BC of a ABC is produced, such that D is one ray BC. The bisector of $\angle A$ meets BC in L as shown in Figure. Prove that $\angle ABC + \angle ACD = 2\angle ALC$

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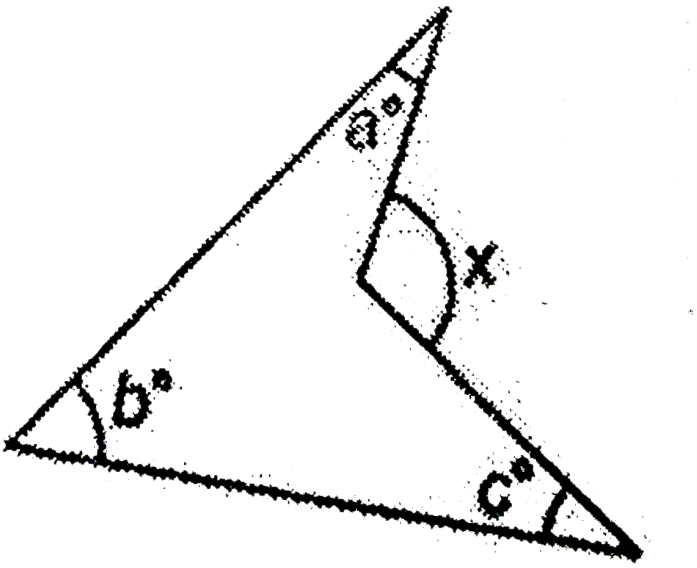
3. In the given figure, prove that x=a+b+c.



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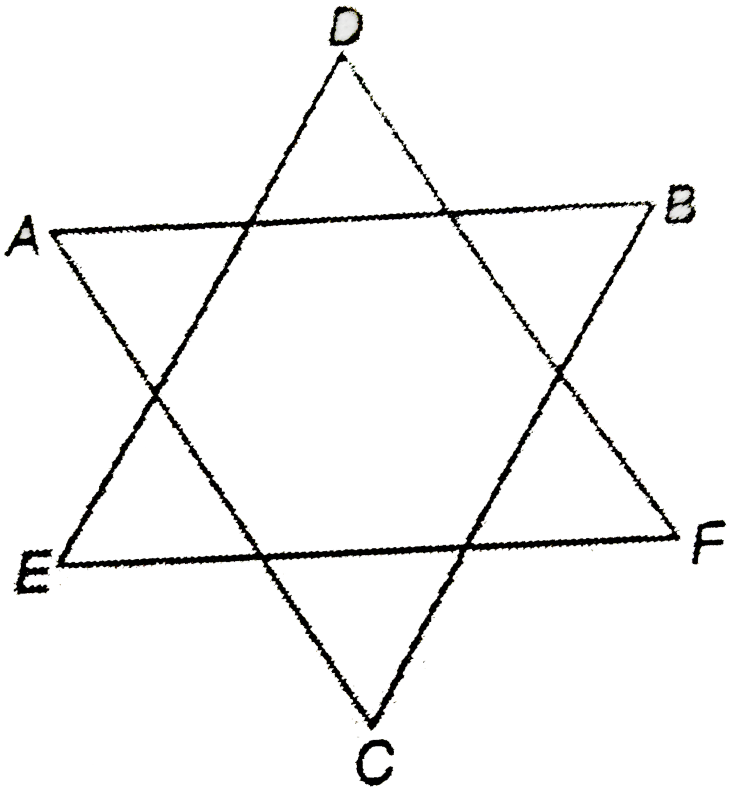
4. From the adjoining figure prove that

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



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5. Prove that the angle between internal bisector of one base angle and the external bisector of the other base angle of a triangle is equal to one-half of the vertical angle.

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

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