doubtnut
India's Number 1 Education App

MATHS

NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

LINES AND ANGLES

Example

1. If the measure of an angle is 62° , what is the measure of its complementary angle?

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2. Two complementary angles are in the ratio 4:5. Find the angles.

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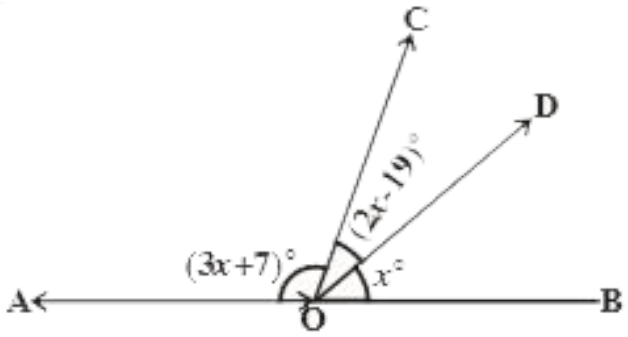
3. In the adjacent figure, $\overline{AB}$ is a straight line. Find the value of x and also find

$\angle AOC, \angle COD$and $\angle BOD$.



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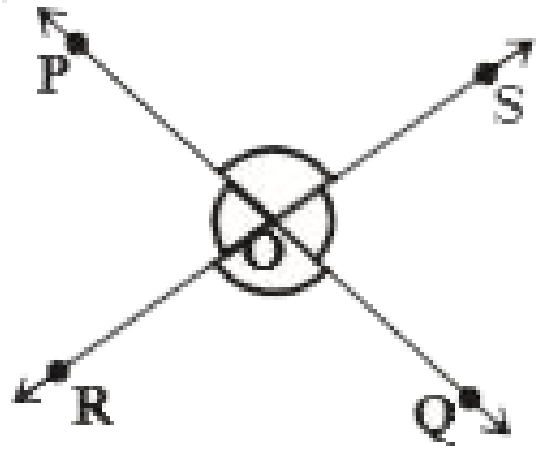
4. In the adjacent figure lines PQ and RS intersect each other at point O. If

$\angle POR : \angle ROQ$= 5: 7, find all the angles.



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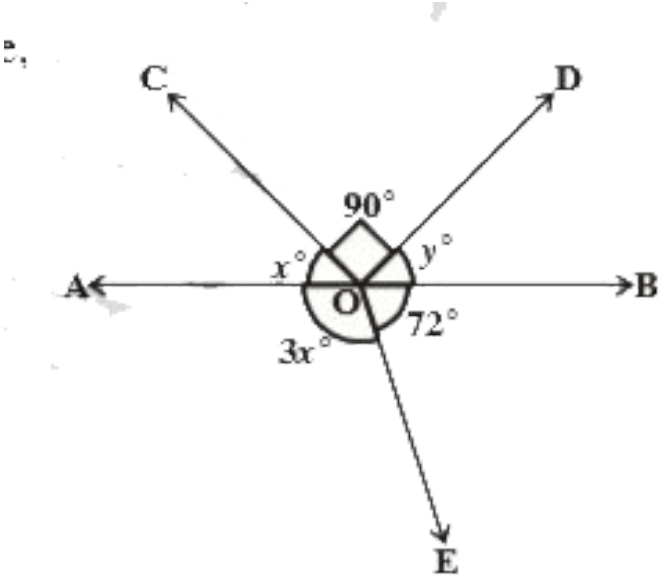
5. Calculate $\angle AOC$, $\angle BOD$ and $\angle AOE$ in the adjacent figure given that

$\angle COD = 90^\circ, \angle BOE = 72^\circ$ and AOB is a straight line,



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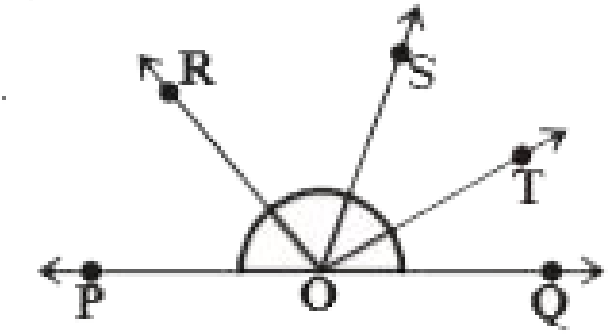
6. In the adjacent figure ray OS stands on a line PQ. Ray OR and ray OT are angle bisectors of $\angle POS$ and $\angle SOQ$ respectively. Find $\angle ROT$.



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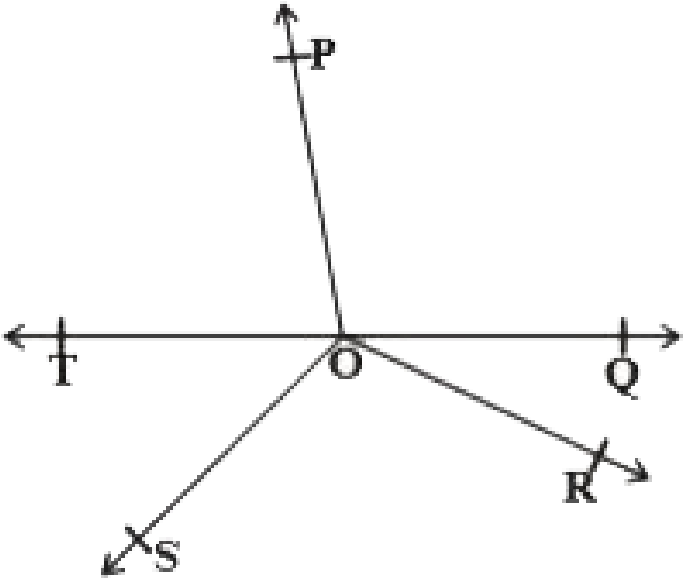
7. In the adjacent figure $\overline{OP}, \overline{OQ}, \overline{OR}$ and$\overline{OS}$ are four rays. Prove that

$$\angle POQ + \angle QOR + \angle SOR + \angle POS = 360^\circ$$

.



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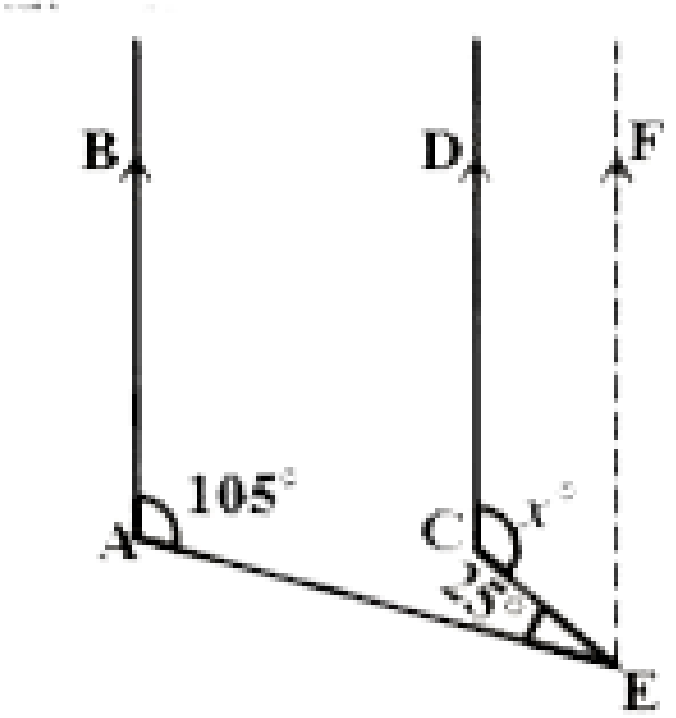
8. In the given figure, AB|| CD. Find the value af

x.



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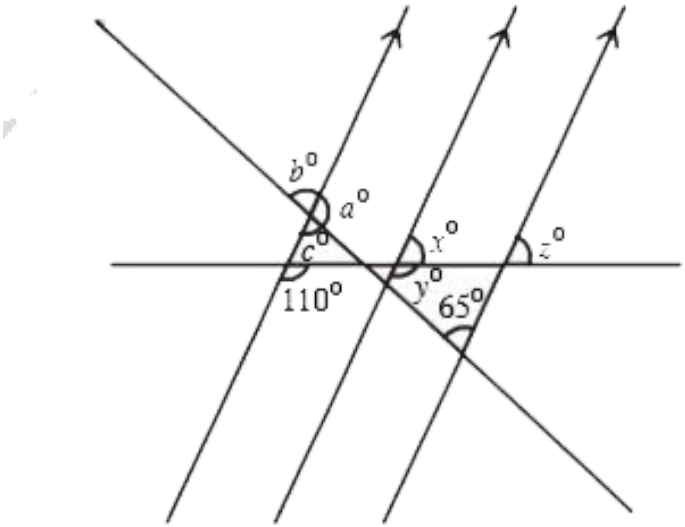
9. In the adjacent figure, find the value of x, y, z and a, b, c.



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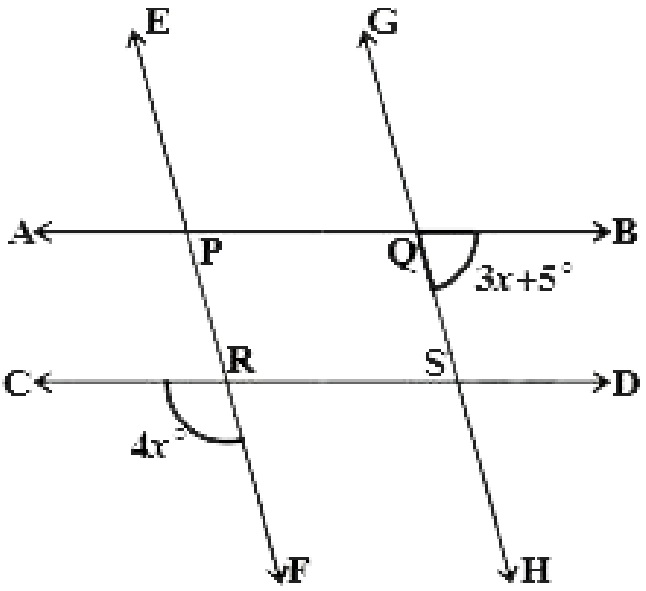
10. In the given figure, lines EF and GH are parallel. Find the value of x if the lines AB and CD are also parallel.



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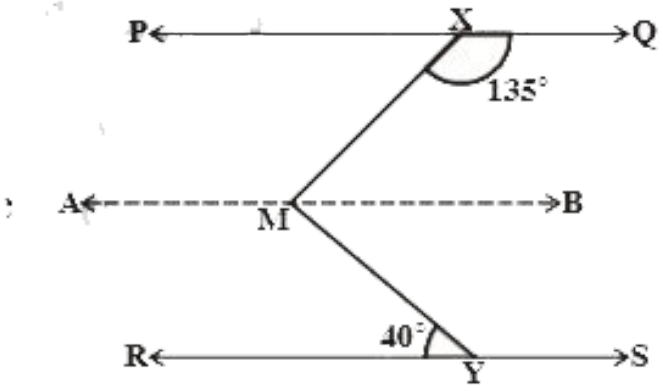
11. In the given figure PQ $\|$ RS, $\angle MXQ = 135^\circ$ and $\angle MYR = 40^\circ$, find `angleXMY.



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12. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

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13. In the given figure AB || CD and CD || EF. Also EA $\perp$ AB. If $\angle BEF = 55^\circ$, find the values of x, y and z.

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14. The angles of a triangle are $(2x)^\circ, (3x+5)^\circ$ and $(4x-14)^\circ$. Find the value of x and the measure of each angle of the triangle

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15. In the adjacent figure, AB || QR, $\angle BAQ = 142^\circ$ and $\angle ABP = 100^\circ$. Find (i)

$\angle APB (ii) \angle AQR$ and (iii) $\angle QRP$

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16. Using information given in the adjacent figure, find the values of x and y .

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17. In the adjacent fig. if QT $\perp$ PR, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$, find x and y.

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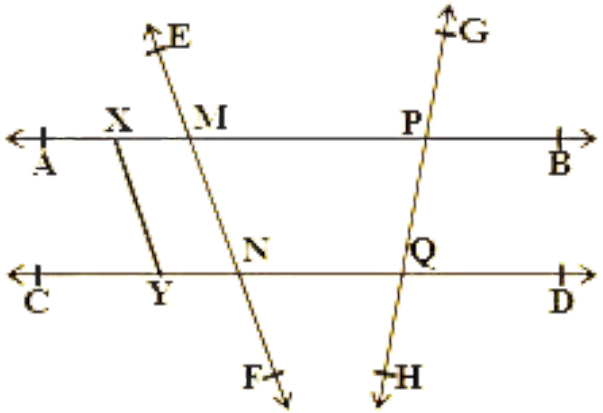
Exercise Xercise 4 1

1. In the given figure, name



(i) any six points

(ii) any five line segments

(iii) any four rays

(iv) any four lines

(v) any four collinear points

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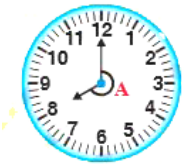
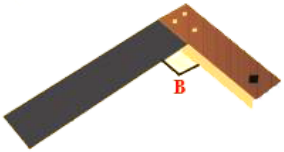
2. Observe the following figures and identify the type of angles in them.





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3. State whether the following statements are true or false :

A ray has no end point.

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4. State whether the following statements are true or false :

Line $\overline{AB}$ is the same as line $\overline{BA}$.

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5. State whether the following statements are true or false :

A ray $\overline{AB}$ is same as the ray $\overline{BA}$.

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6. State whether the following statements are true or false :

A line has a definite length.

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7. State whether the following statements are true or false :

A plane has length and breadth but no thickness.

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8. State whether the following statements are true or false :

Two distinct points always determine a unique line.

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9. State whether the following statements are true or false :

Two lines may intersect in two points.

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10. State whether the following statements are true or false :

Two intersecting lines cannot both be parallel to the same line.

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11. What is the angle between two hands of a clock when the time in the clock is

(a) 9'O clock (b) 6'O clock (c) $7:00PM$

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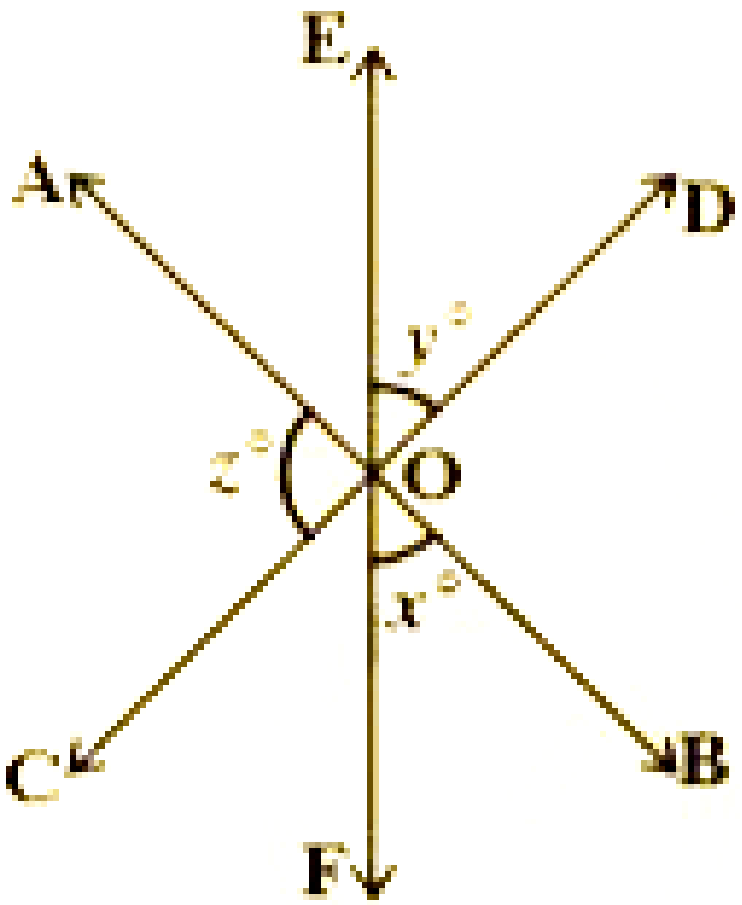
Exercise Xercise 4 2

1. In the given figure three lines $\overline{AB}$, $\overline{CD}$ and $\overline{EF}$ intersecting at O. Find the values of x, y

and z it is being given that x : y : z = 2 : 3 : 5



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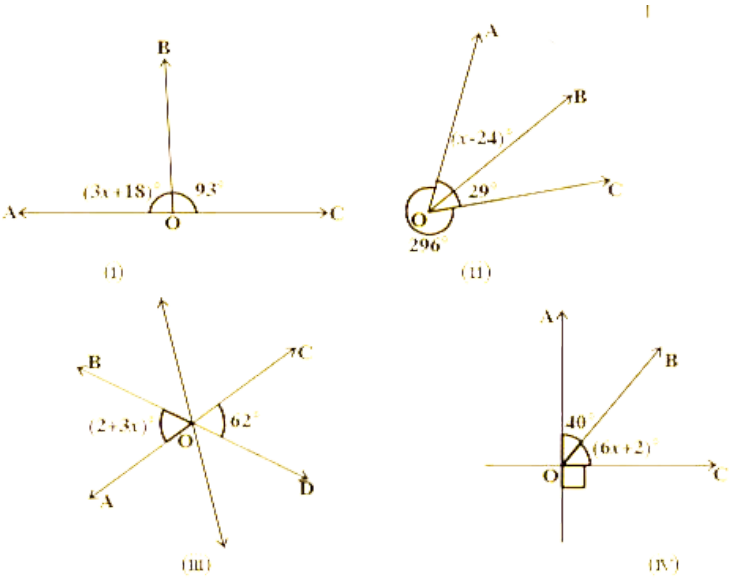
2. Find the value of x in the following figures.



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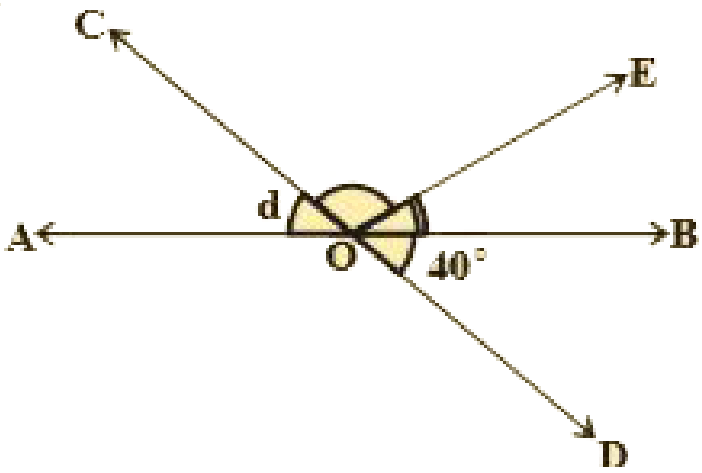
3. In the given figure lines $\overline{AB}$ and $\overline{CD}$ intersect at O. If $\angle AOC + \angle BOE = 70^\circ$ and

$\angle BOD = 40^\circ$, find $\angle BOE$ and reflex $\angle COE$.



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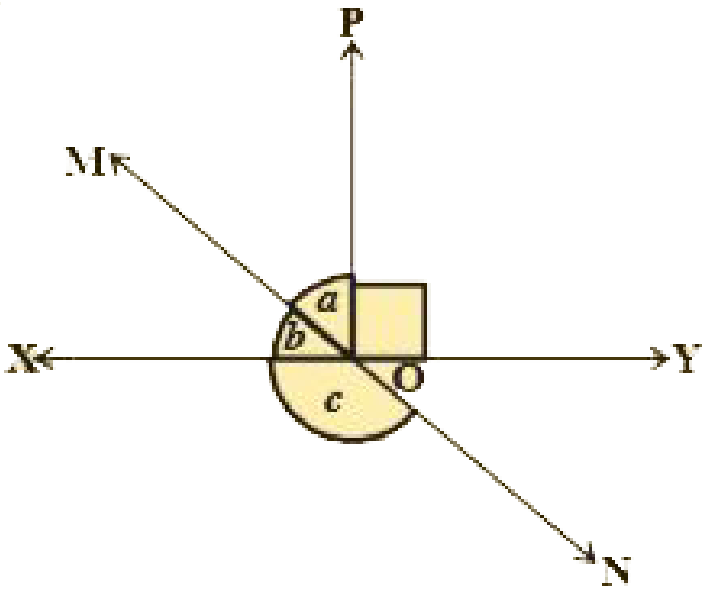
4. In the given figure lines $\overline{XY}$ and $\overline{MN}$ intersect at O. If $\angle POY = 90^\circ$ and a: b = 2 : 3,

find c.



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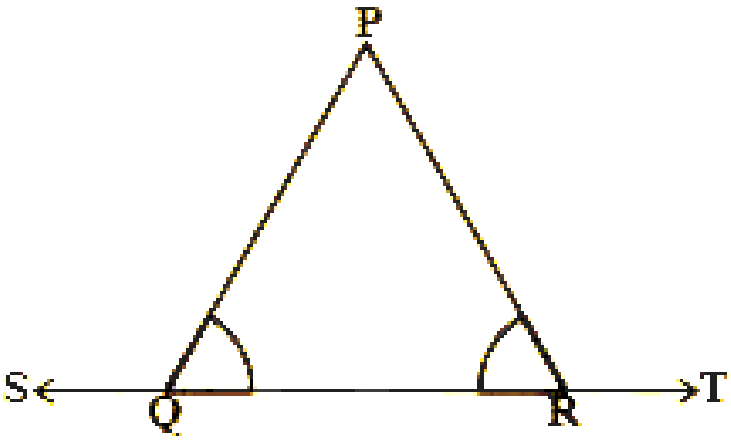
5. In the given figure $\angle PQR = \angle PRQ$, then prove that $\angle PQS = \angle PRT$.



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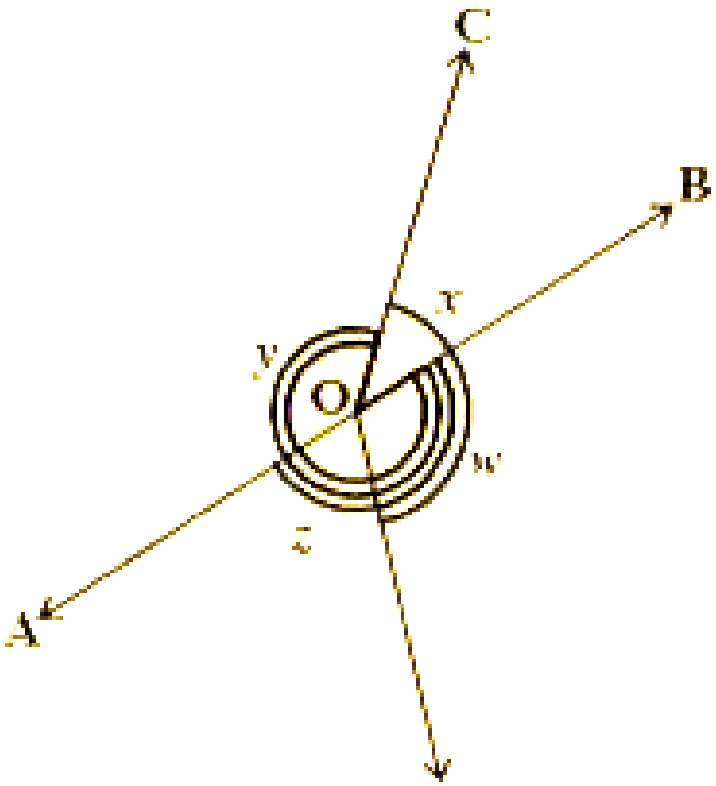
6. In the given figure, if $x + y = w + z$, then prove that AOB is a line.



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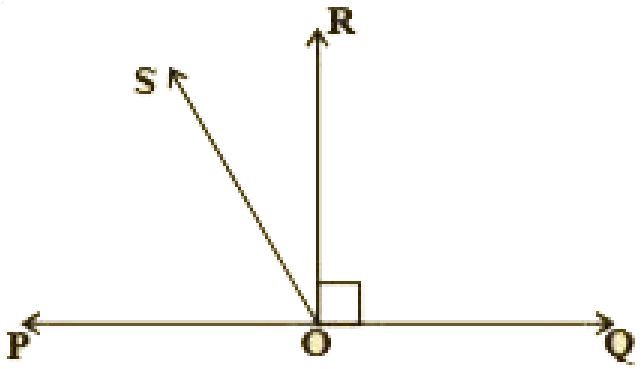
7. In the given figure $\overline{PQ}$ is a line. Ray $\overline{OR}$ is perpendicular to line $\overline{PQ}$. $\overline{OS}$ is another ray

lying between rays $\overline{OP}$and $\overline{OR}$. Prove that $\angle ROS = \frac{1}{2}\angle QOS - \angle POS$



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8. It is given that $\angle XYZ = 64^\circ$ and XY is produced to point P. A ray YQ bisects $\angle ZYP$.

Draw a figure from the given information. Find $\angle XYQ$ and reflex $\angle QYP$.

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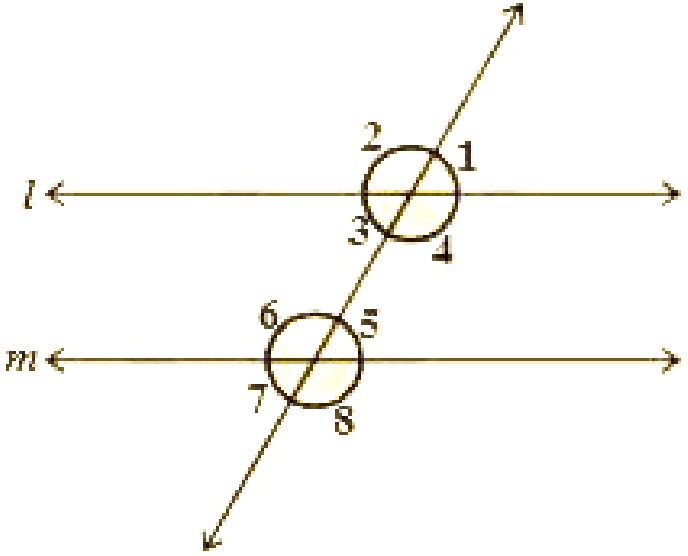
Exercise Xercise 4 3

1. It is given that l || m to prove $\angle 1$ is supplement to $\angle 8$. Write reasons for the statement.

Statement	Reasons
$i.\ l \mid\mid m$	.....
$ii.\ \angle 1 = \angle 5$	.....
$iii.\ \angle 5 + \angle 8 = 180^\circ$	..... .
$iv \angle 5 + \angle 8 = 180^\circ$	.....
$v.\ \angle 1$is supplement to$\angle 8$	.....



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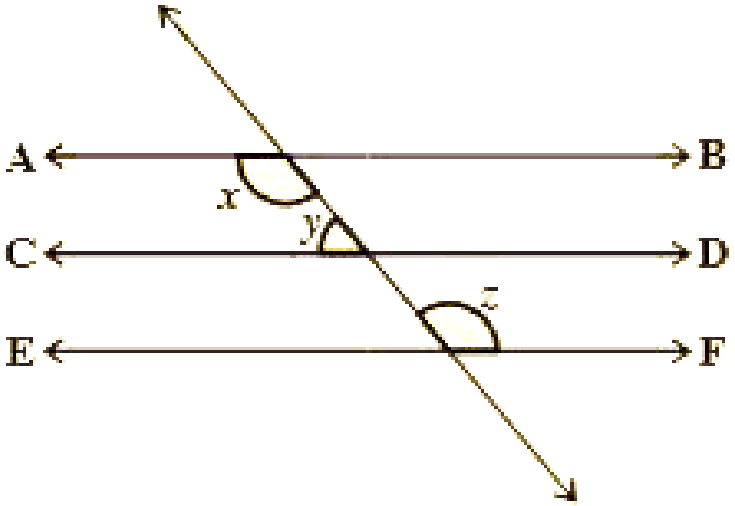
2. In the adjacent figure AB || CD, CD || EF and y : z = 3 : 7, find x.



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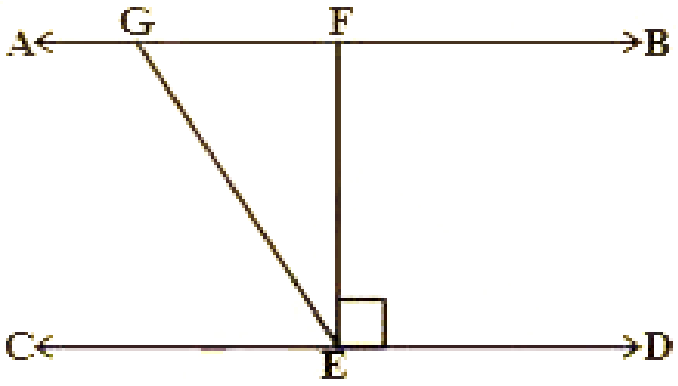
3. In the adjacent figure AB || CD, EF $\perp$ CD and $\angle GED = 126^\circ$, find $\angle AGE$, $\angle GEF$ and

$\angle FGE$.



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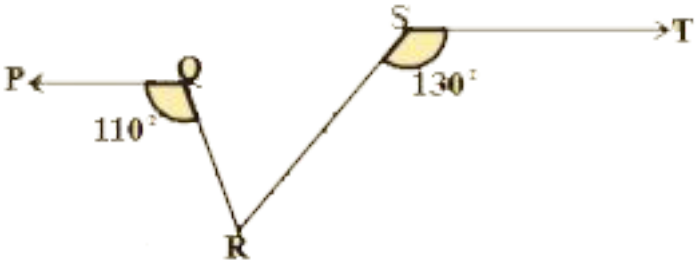
4. In the adjacent figure PQ || ST, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$, find

$\angle QRS$.



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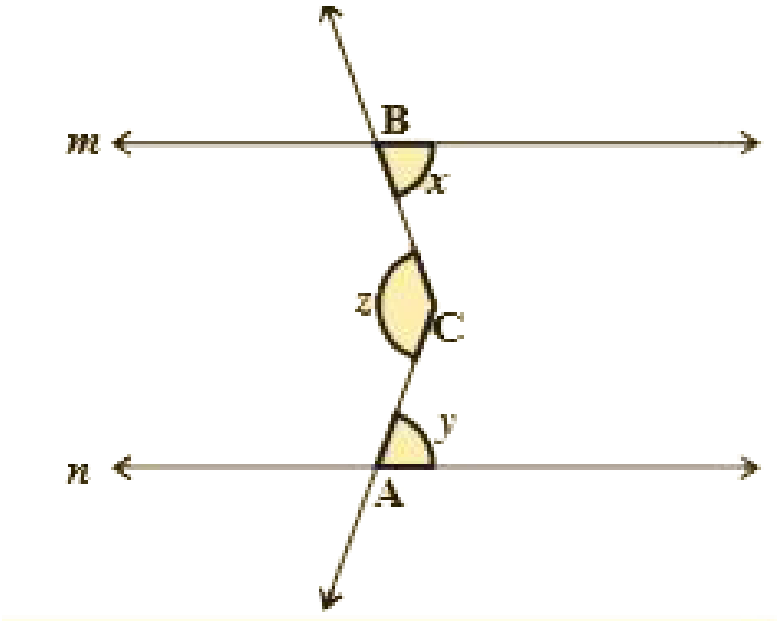
5. In the adjacent figure m || n. A, B are any two points on m and n respectively. Let 'C' be an interior, point between the lines m and n. Find

$\angle ACB$.



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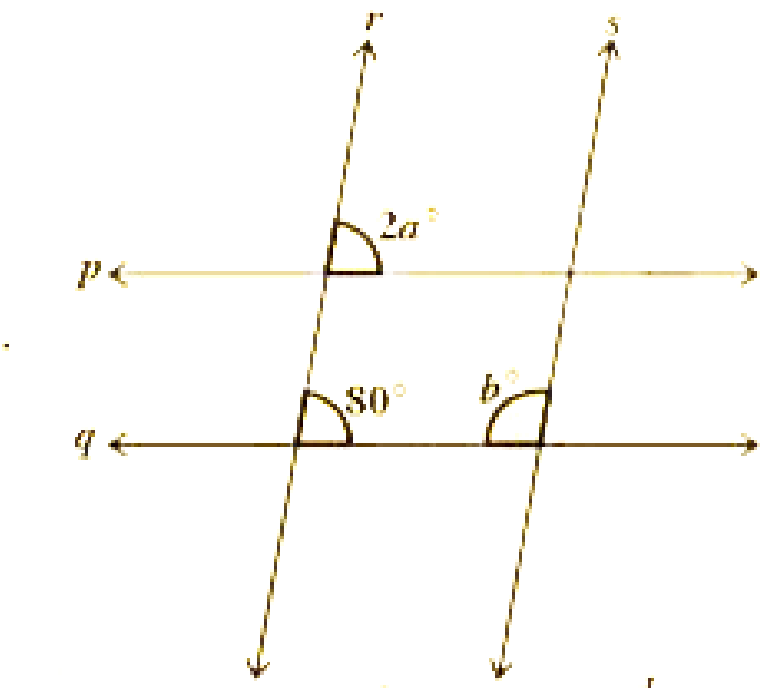
6. Find the value of a and b, given that p || q and r || s.



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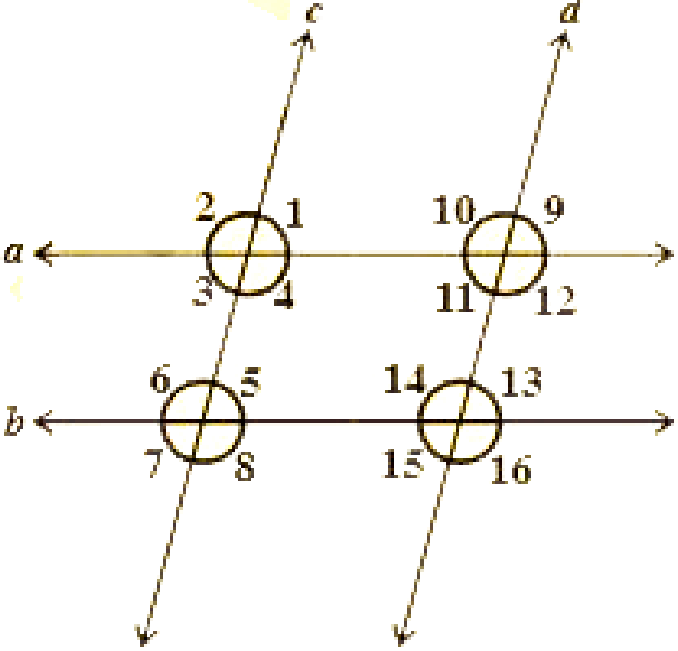
7. If in the figure a || b and c || d, then name the angles that are congruent to (i) $\angle 1 (ii) \angle 2.$



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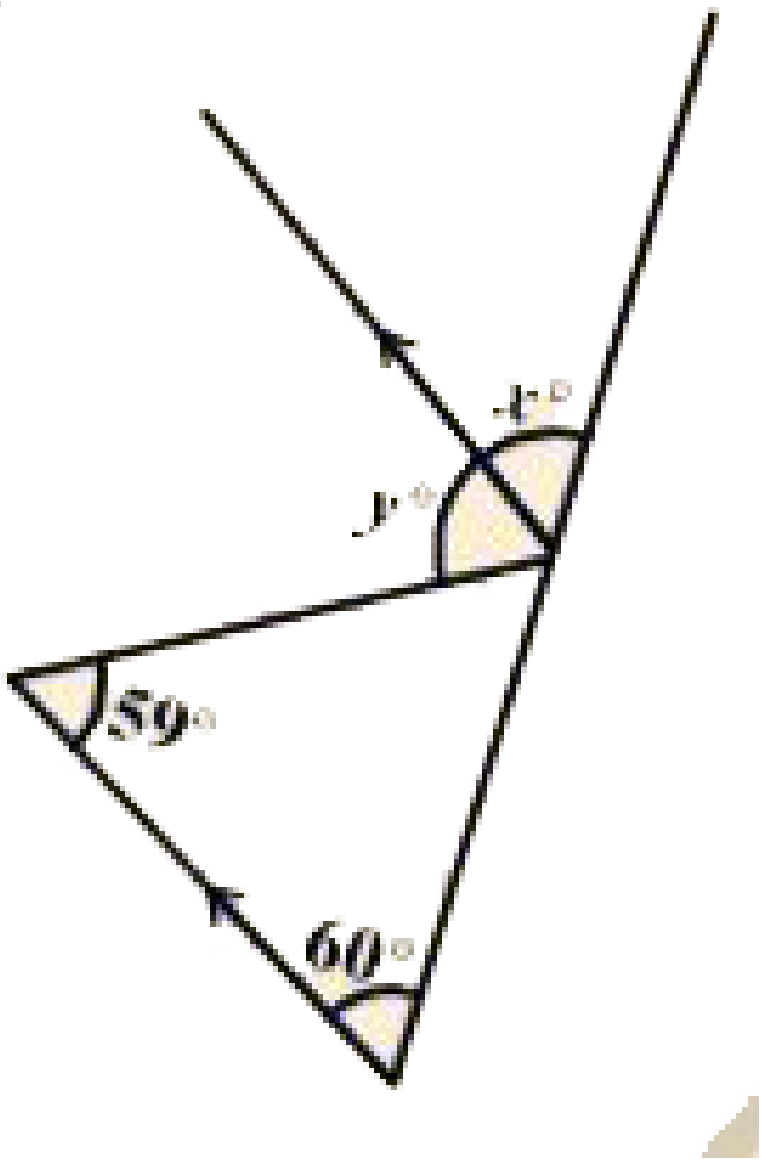
8. In the figure the arrow head segments are parallel. find the value of x and y.



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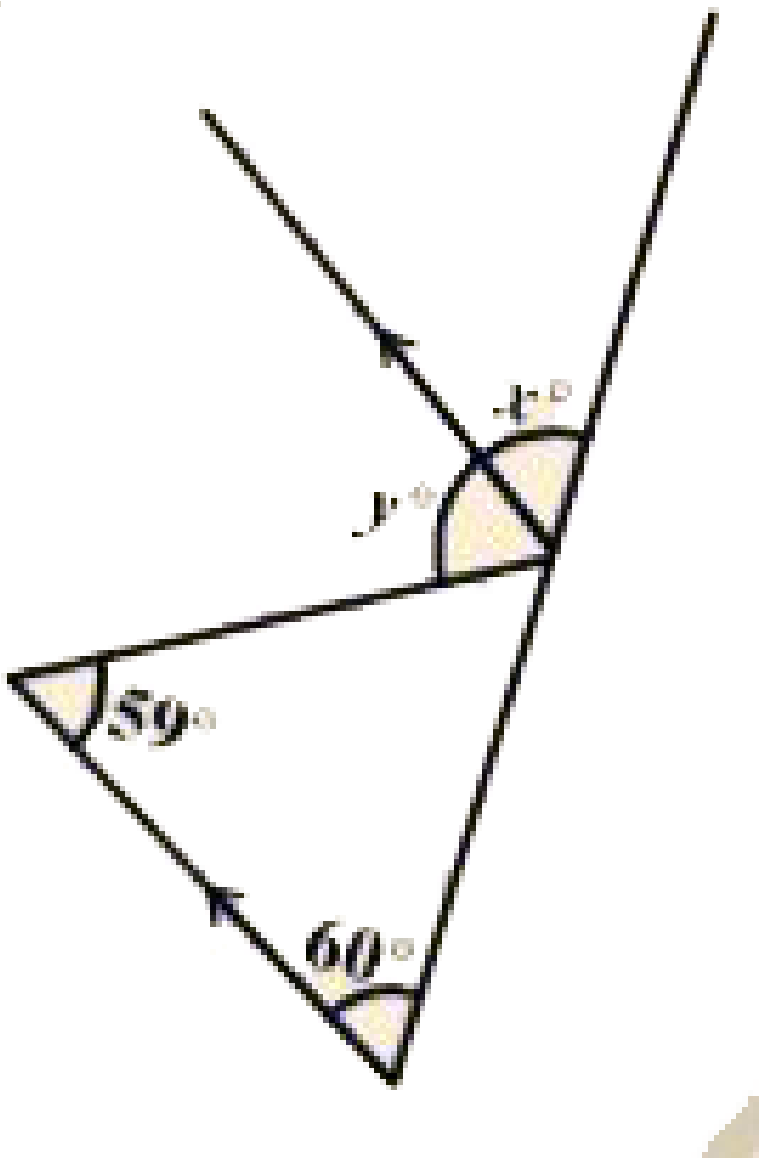
9. In the figure the arrow head segments are parallel. find the value of x and y.



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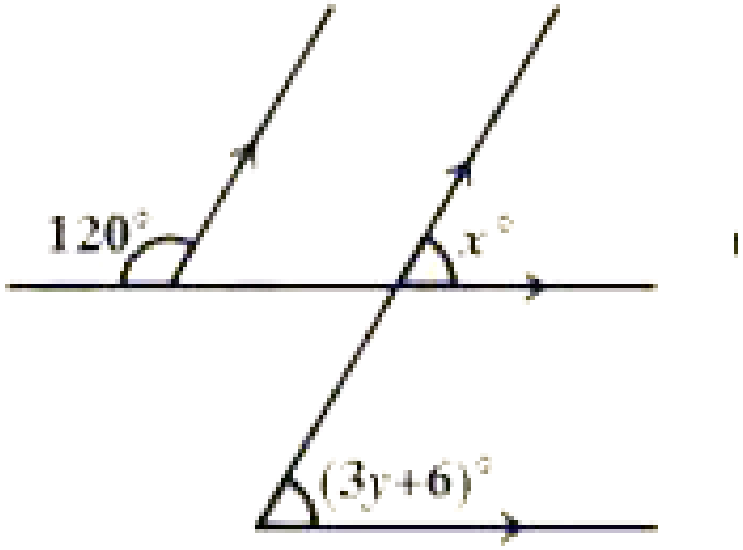
10. Find the value of x and y from the figure.



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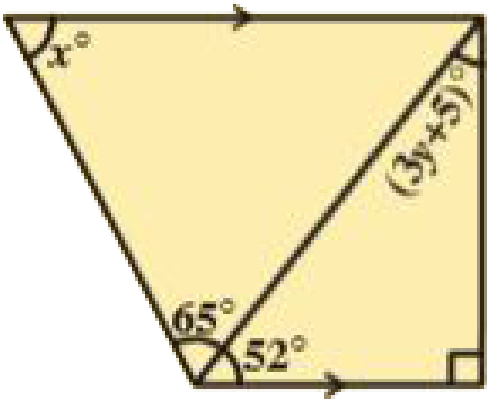
11. From the figure find x and y.



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12. Draw figures for the following statement. "If the two arms of one angle are respectively perpendicular to the two arms of another

angle then the two angles are either equal or supplementary".

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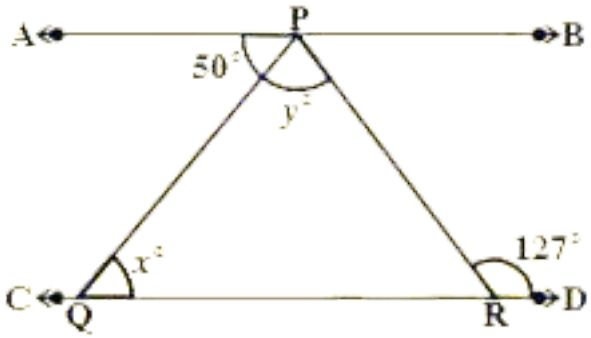
13. In the given figure, if AB || CD, $\angle APQ = 50^\circ$ and $\angle PRD = 127^\circ$, find x and y

$= 50^\circ$



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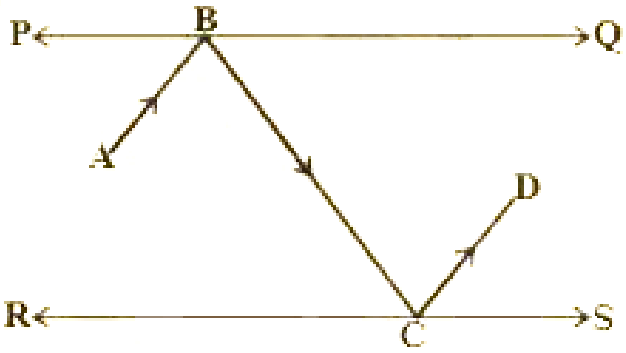
14. In the adjacent figure PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflected

back along CD . Prove that AB || CD.



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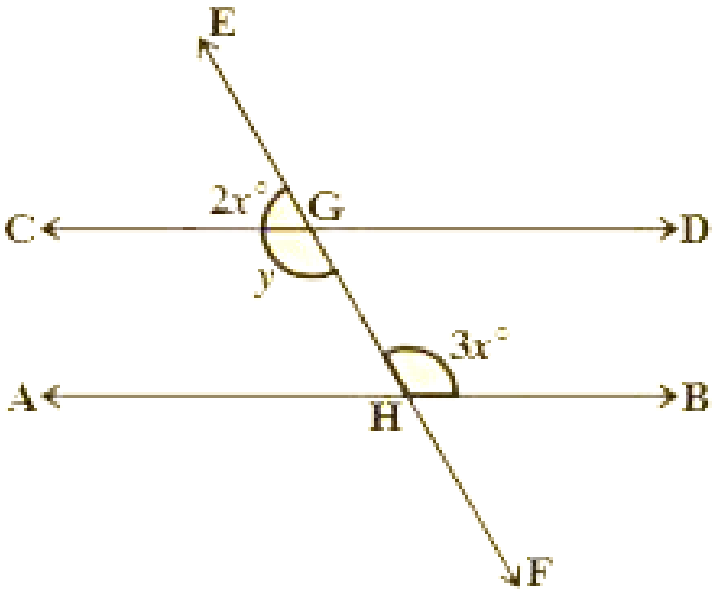
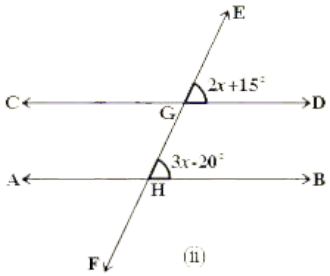
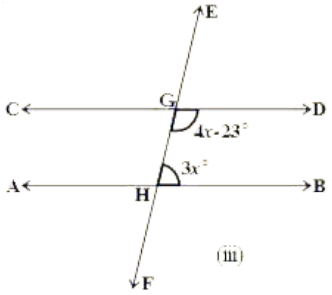
15. In the figures given below AB || CD. EF is the transversal intersecting AB and CD at G and H respectively. Find the values of x and y. Give

reasons







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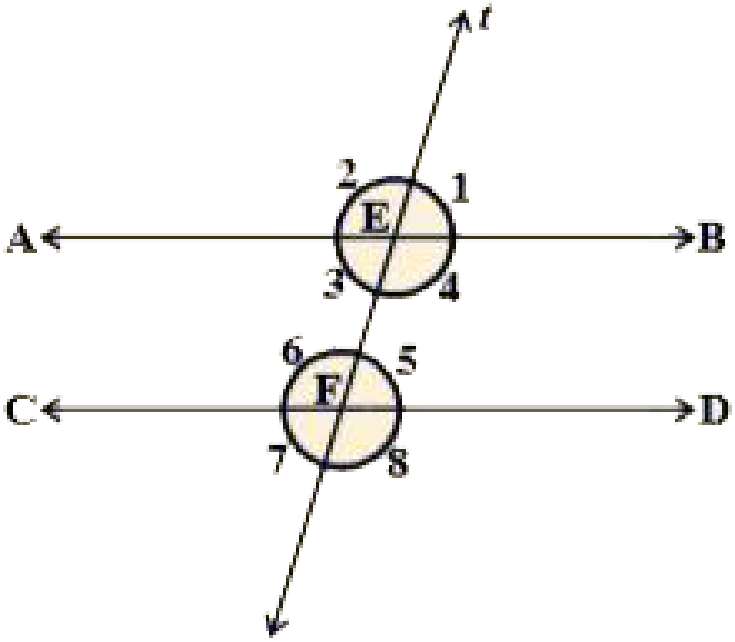
16. In the adjacent figure, AB || CD, 't' is a transversal intersecting E and F respectively. If $\angle 2 : \angle 1 = 5 : 4$, find the measure of each marked angles.



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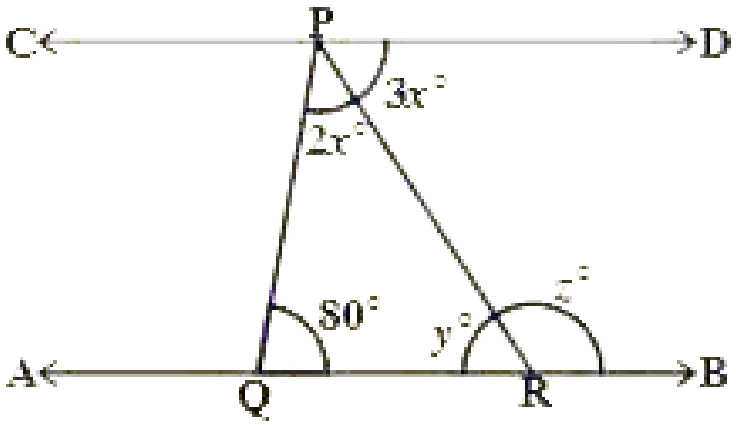
17. In the adjacent figure AB || CD. Find the value of x, y and z.



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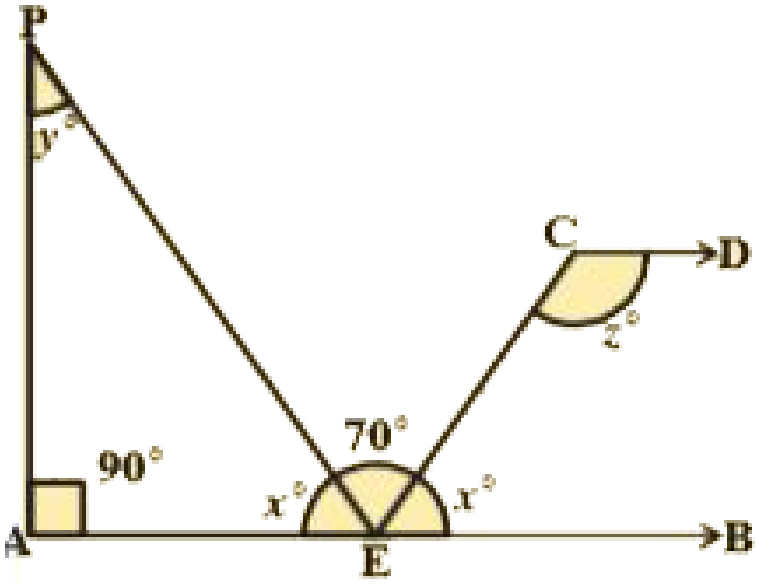
18. In the adjacent figure AB || CD. Find the values of x, y and z.



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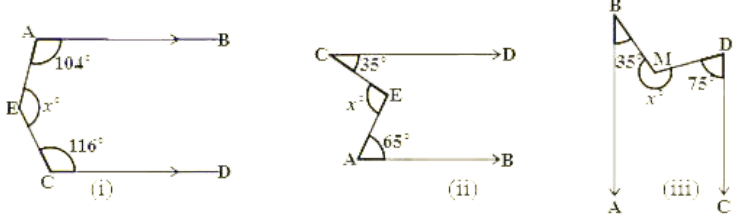
19. In each of the following figures AB || CD. Find the value of x in each case.



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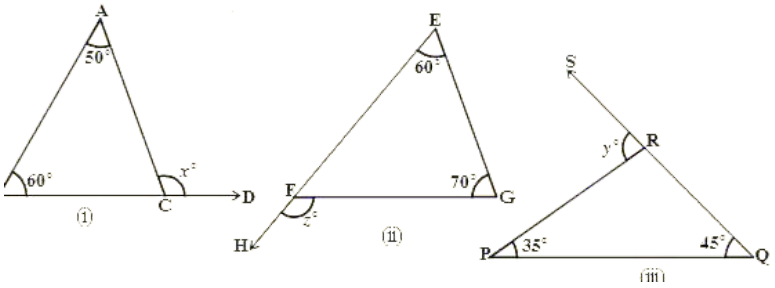
Exercise Xercise 4 4

1. In the given triangles, find out x, y and z.



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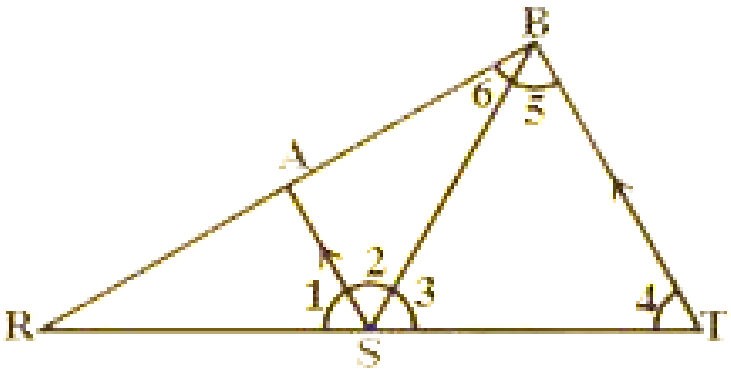
2. In the given figure AS || BT, $\angle 4 = \angle 5$ $\overline{SB}$ bisects $\angle AST$. Find the measure of $\angle 1$



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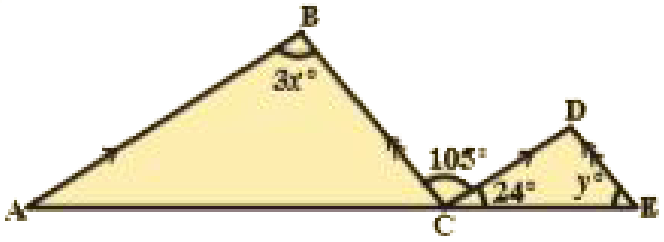
3. In the given figure AB || CD, BC || DE then find the values of x and y



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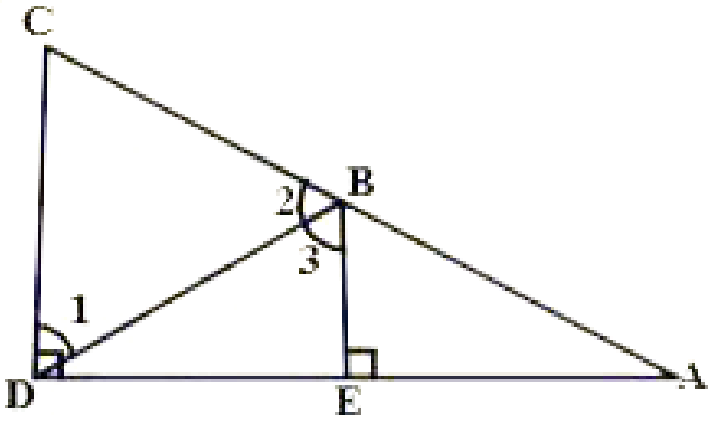
4. In the adjacent figure $BE \perp$ DA and CD $\perp$ DA then prove that m$\angle 1 \cong m\angle 3$.



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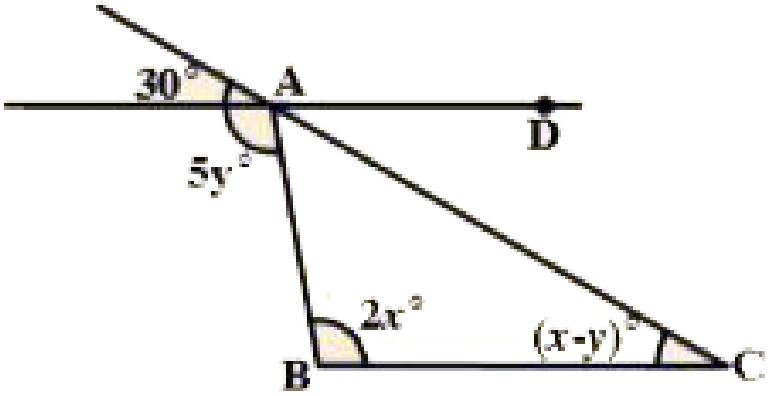
5. Find the values of x, y for which the lines AD and BC become parallel.



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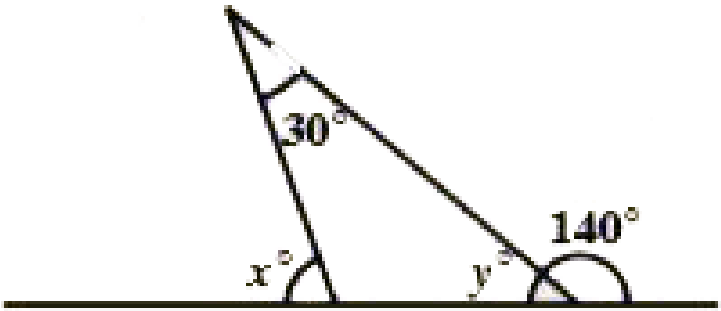
6. Find the values of x and y in the figure .



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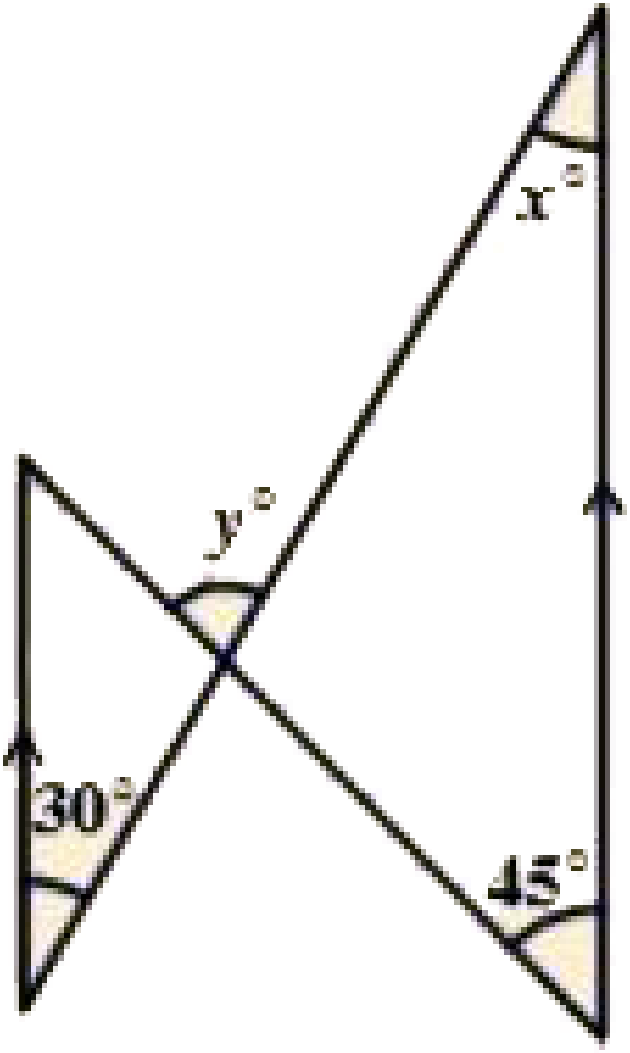
7. In the given figure segments shown by arrow heads are parallel. Find the values of x

and y.

-



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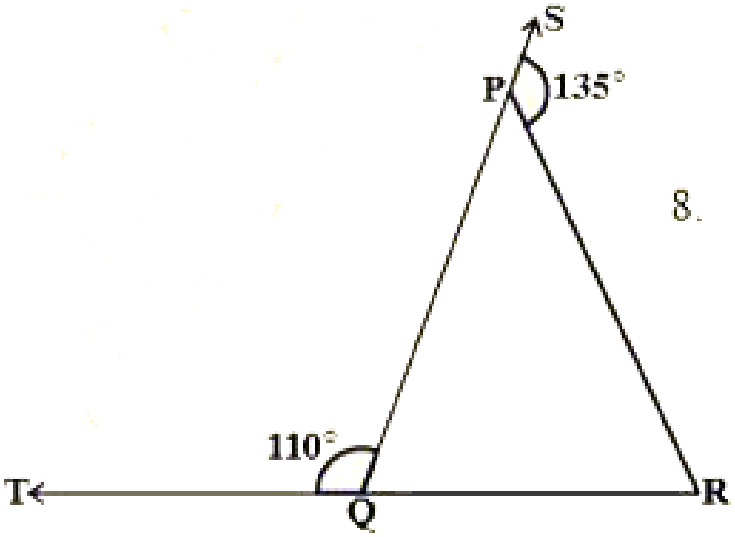
8. In the given figure sides QP and RQ of ΔPQR are produced to points S and T respectively. If $\angle SPR = 135^\circ$ and $\angle PQT = 110^\circ$, find $\angle PRQ$.



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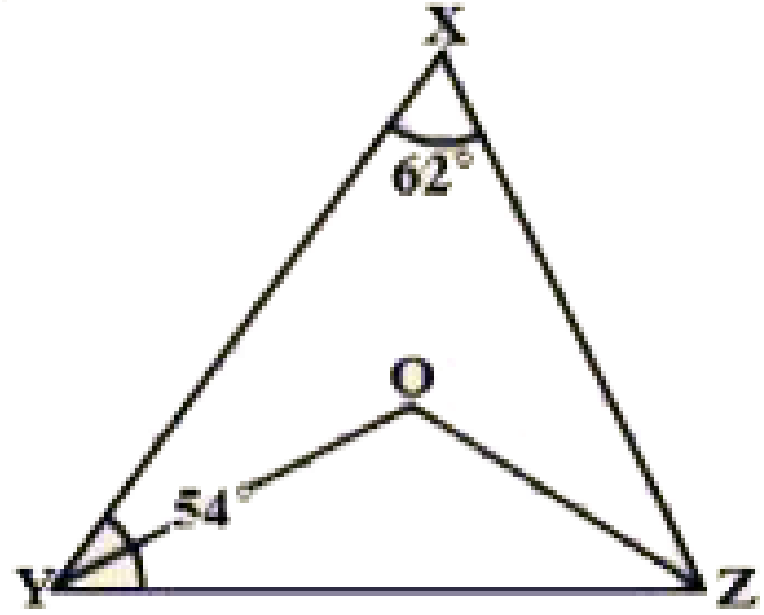
9. In the given figure, $\angle X = 62^\circ, \angle XYZ = 54^\circ$. In ΔXYZ If YO and ZO are the bisectors of $\angle XYZ$ and $\angle XZY$ respectively find $\angle OZY$ and $\angle YOZ$



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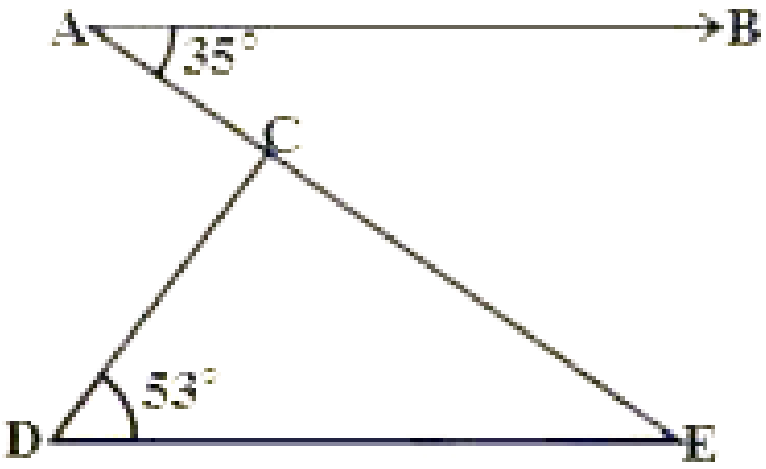
10. In the given figure if AB $\|$ DE, $\angle BAC = 35^\circ$ and $\angle CDE = 53^\circ$, find $\angle DCE$.



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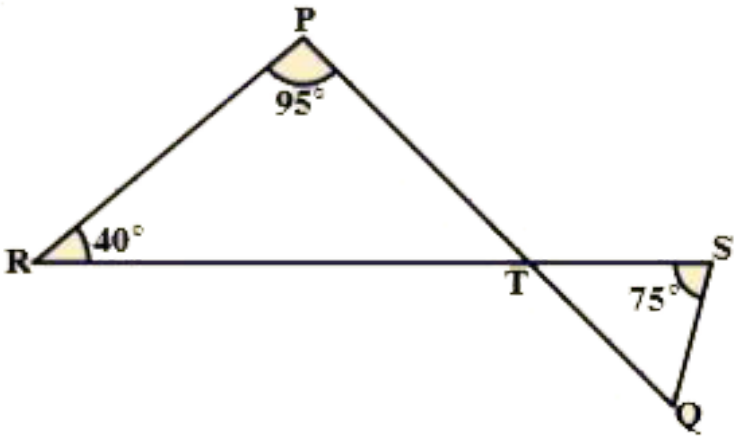
11. In the given figure if line segments PQ and RS intersect at point T, such that $\angle PRT = 40^\circ, \angle RPT = 95^\circ$ and $\angle TSQ = 75^\circ$, find $\angle SQT$



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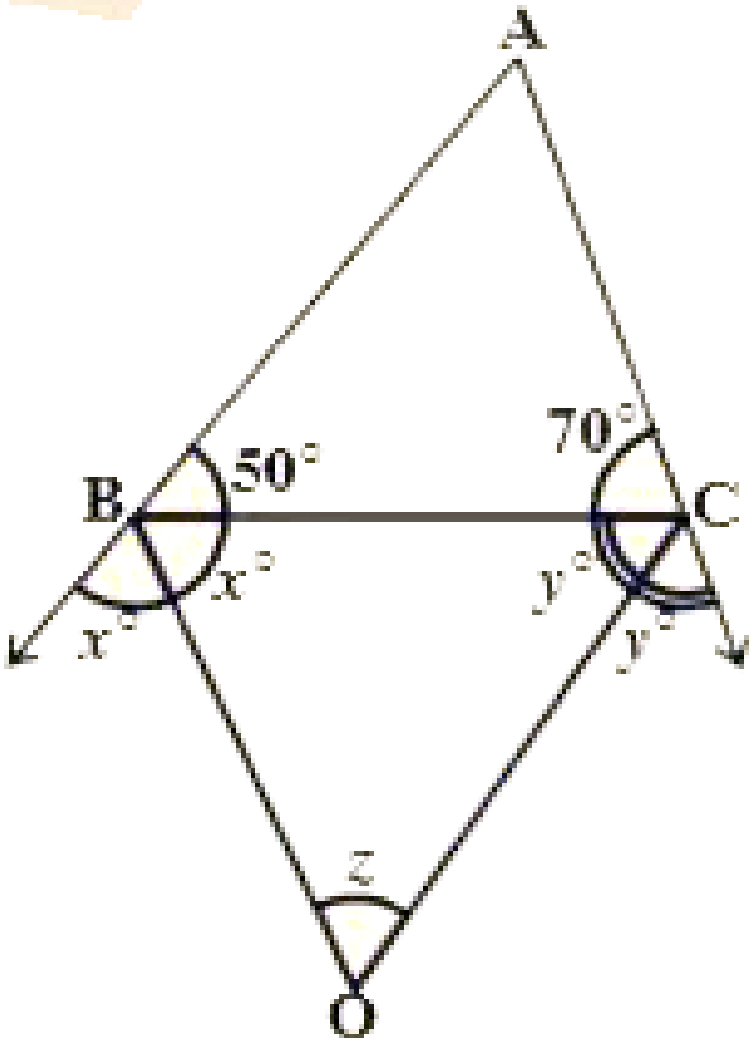
12. In the adjacent figure, ABC is a triangle in which $\angle B = 50^\circ$ and $\angle C = 70^\circ$. Sides AB and AC are produced. If ‘z’ is the measure of the angle between the bisectors of the

exterior angles so formed, then find 'z'.



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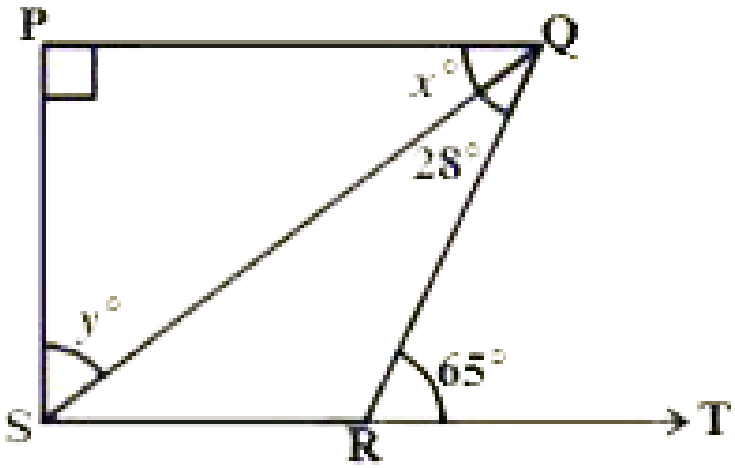
13. In the given figure if PQ $\perp$ PS, PQ $\|$ SR, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the values of x and y



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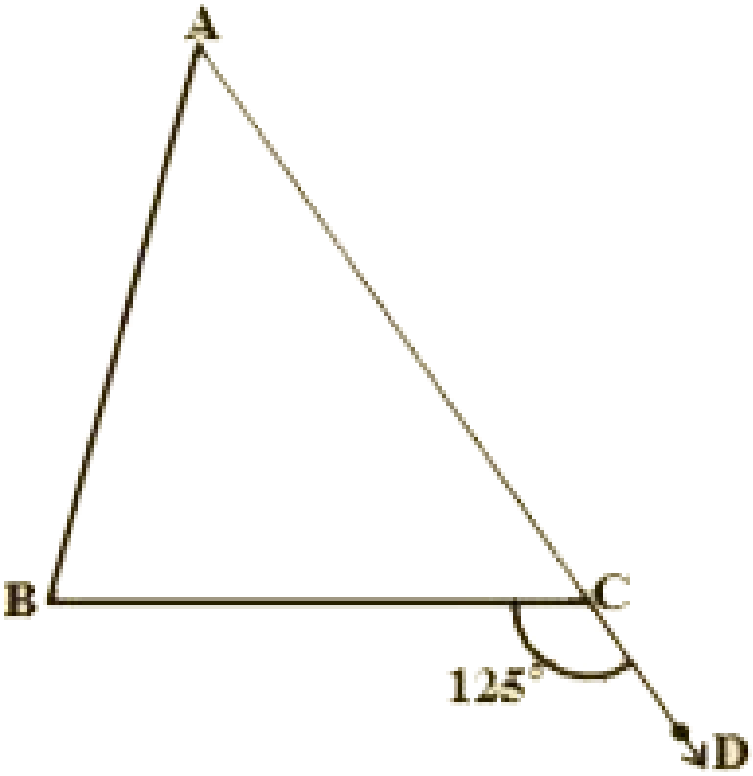
14. In the given figure $\triangle$ ABC side AC has been produced to D. $\angle BCD = 125^\circ$ and $\angle A : \angle B = 2:3$, find the measure of $\angle A$ and $\angle B$



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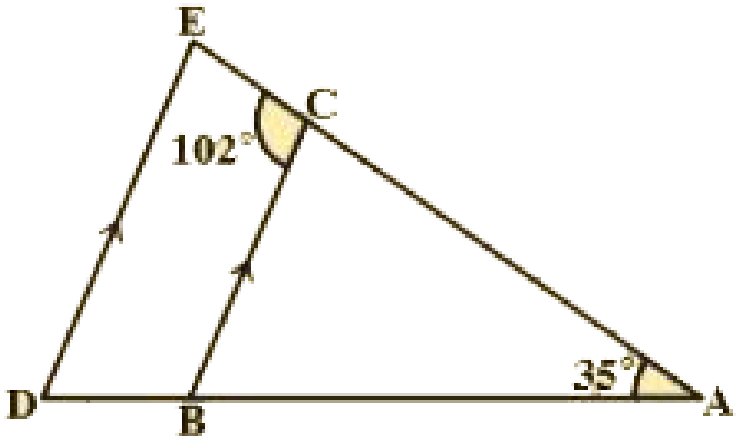
15. In the adjacent figure, it is given that, BC || DE, $\angle BAC = 35^\circ$ and $\angle BCE = 102^\circ$. Find the measure of (i) $\angle BCA (ii)$angleADE and (iii)angleCED`.



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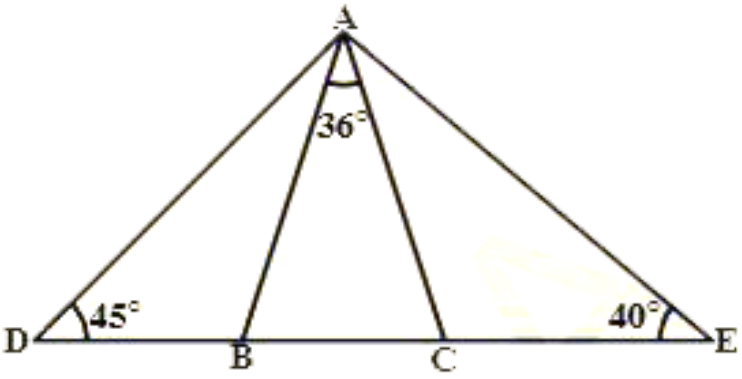
16. In the adjacent figure, it is given that AB =AC, $\angle BAC = 36^\circ, \angle ADB = 45^\circ$ and $\angle AEC = 40^\circ$. Find (i) $\angle ABC (ii) \angle ACB (iii) \angle DAB (iv) \angle EAC.$



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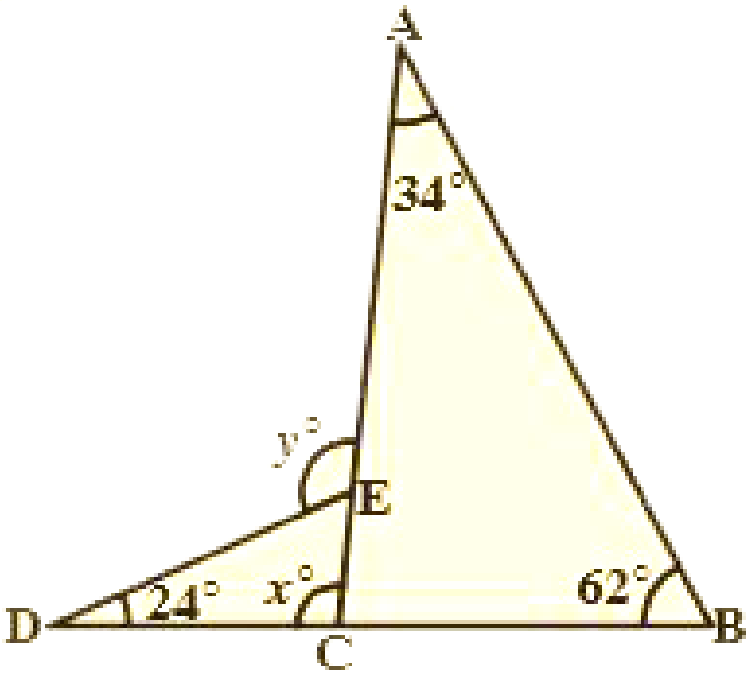
17. Using information given in the figure, calculate the value of x and y



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Do These

1. Write the complementary, supplementary and conjugate angles for the following angles.

$(a) 45^\circ \; (b) 75^\circ \; (c) 54^\circ \; (d) 30^\circ$

$(e) 60^\circ \; (f) 90^\circ \; (g) 0^\circ$

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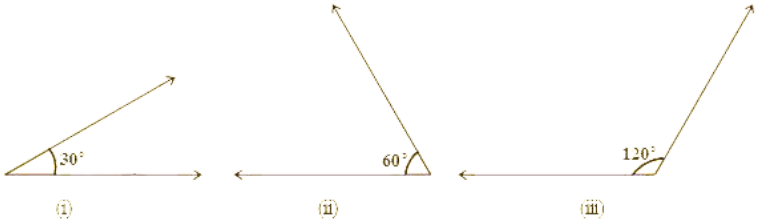
2. Which pairs of following angles become complementary or supplementary angles?



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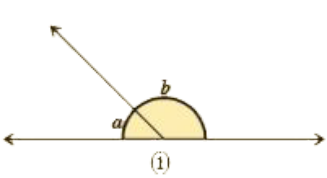
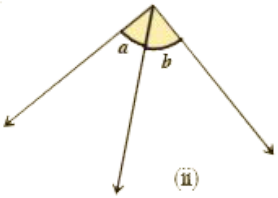
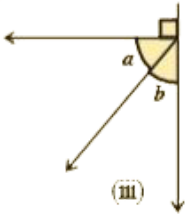
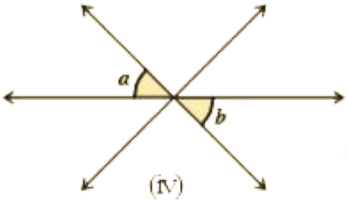
3. Classify the given angles as pairs of complementary, linear pair, vertically opposite and adjacent angles.









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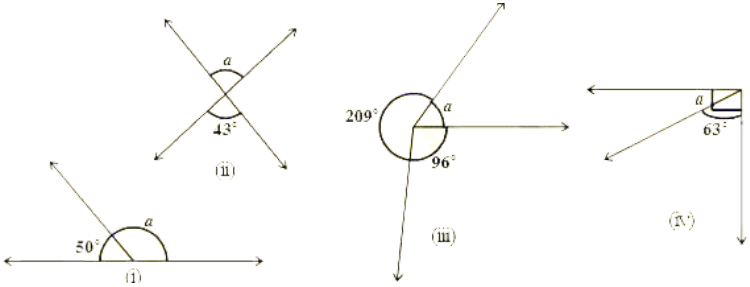
4. Find the measure of angle ‘a’ in each figure.

Give reason in each case .



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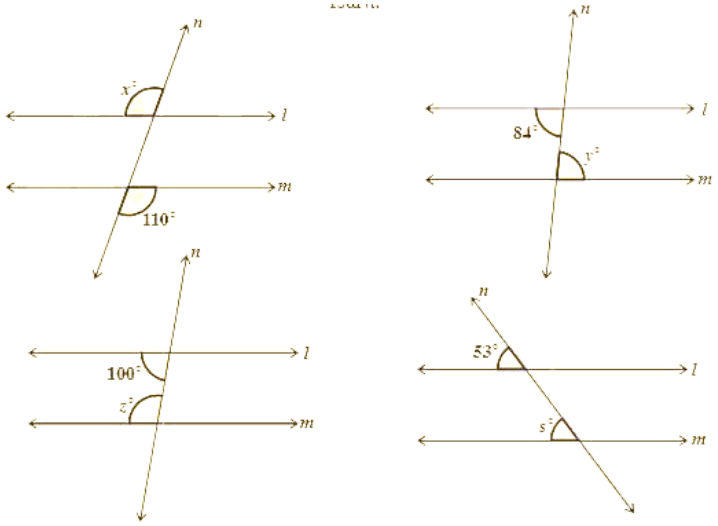
5. Find the measure of each angle indicated in each figure where l and m are parallel lines intersected by transversal n.



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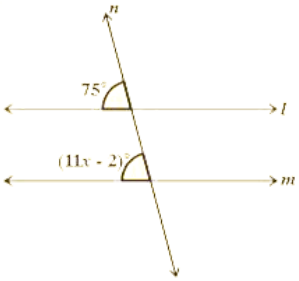
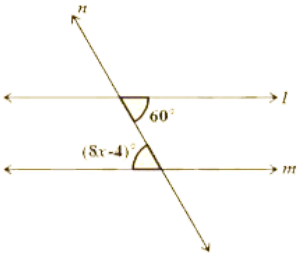
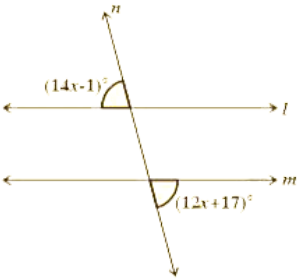
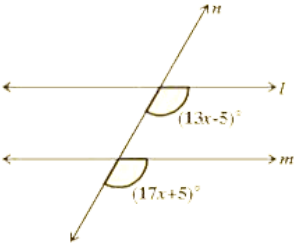
6. If l || m, then solve for ‘x’ and give reasons.









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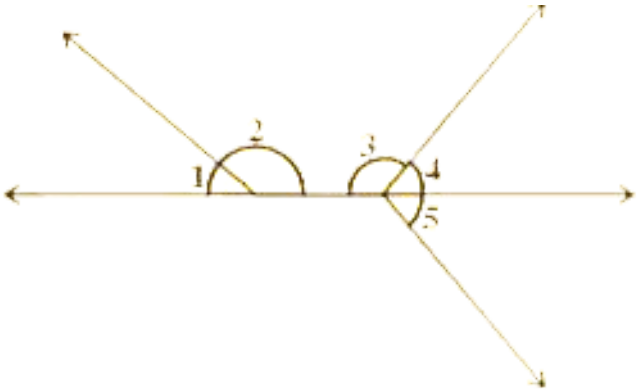
Try This

1. List the adjacent angles in the given figure.



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2. Find the measure of the question marked angle in the given figure

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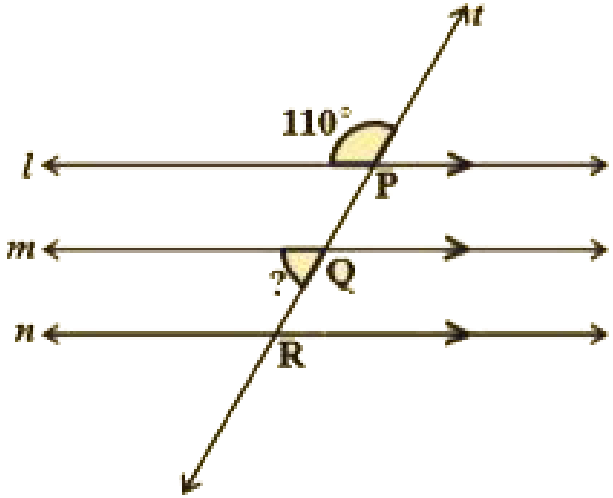
3. Find the angles which are equal to $\angle P$.



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Think Discuss And Write

1. What is the difference between intersecting lines and concurrent lines ?

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2. Linear pair of angles are always supplementary. But supplementary angles need not form a linear. Why ?

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3. If the sides of a triangle are produced in order, what will be the sum of exterior angles thus formed ?

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