



MATHS

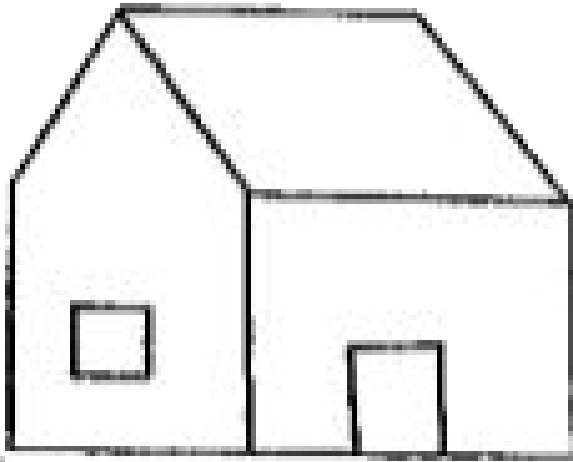
BOOKS - NAND LAL PUBLICATION

LINES AND ANGLES

Question

1. You already know how to identify different lines, line segments and angles in a given shape. Can you identify line segment and

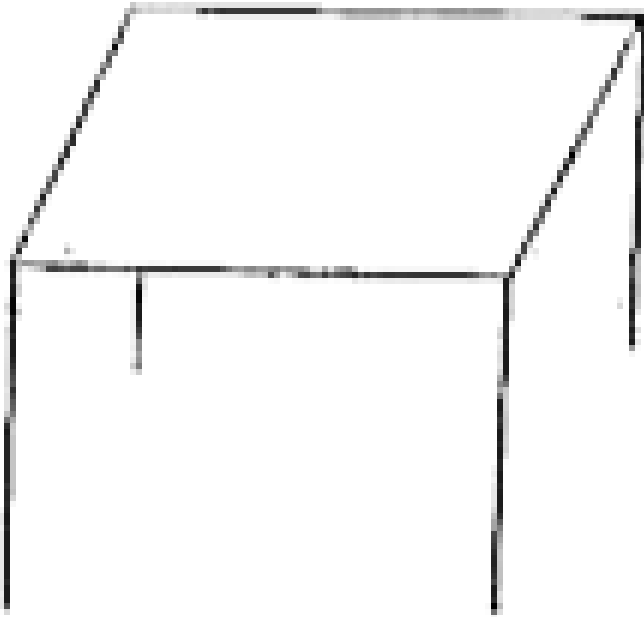
angles formed in the figure ?



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2. You already know how to identify different lines, line segments and angles in a given shape. Can you identify line segment and

angles formed in the figure ?



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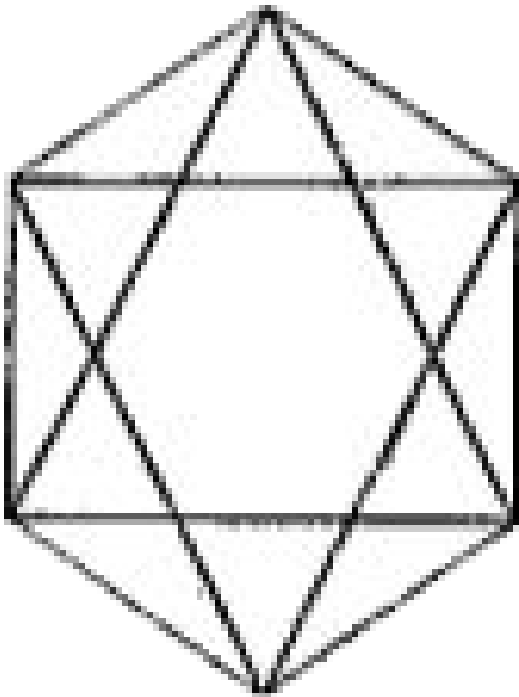
3. You already know how to identify different lines, line segments and angles in a given

shape. Can you identify line segment and angles formed in the figure ?



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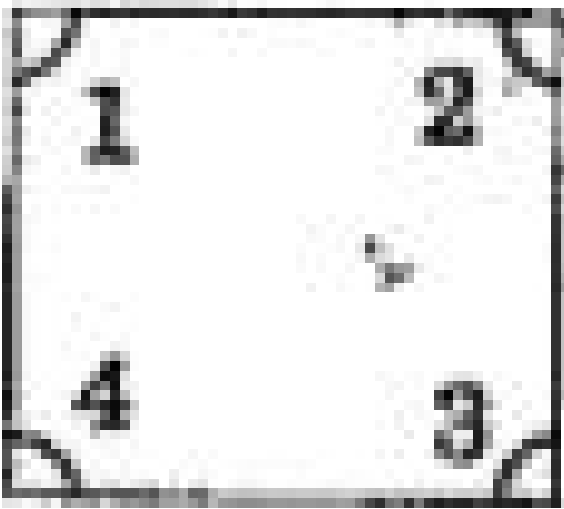
4. You already know how to identify different lines, line segments and angles in a given shape. Can you identify line segment and angles formed in the figure ?



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Try This

1. List figure around you and identify the acute, obtuse and right angle found in them,



Square



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2. List figure around you and identify the acute, obtuse and right angle found in them,

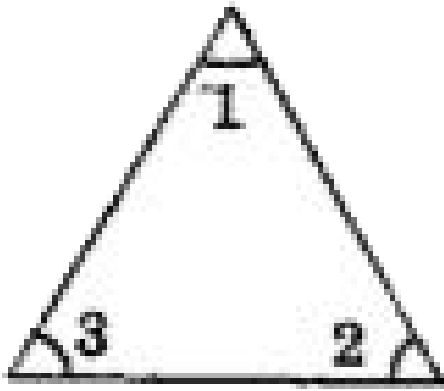


Rectangle



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3. List figure around you and identify the acute, obtuse and right angle found in them,

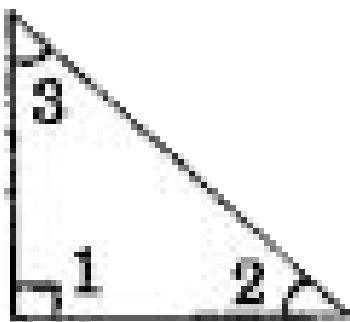


Equilateral triangle



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4. List figure around you and identify the acute, obtuse and right angle found in them,



Right angled triangle



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5. List figure around you and identify the acute, obtuse and right angle found in them,



Parallelogram



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6. List figure around you and identify the acute, obtuse and right angle found in them,

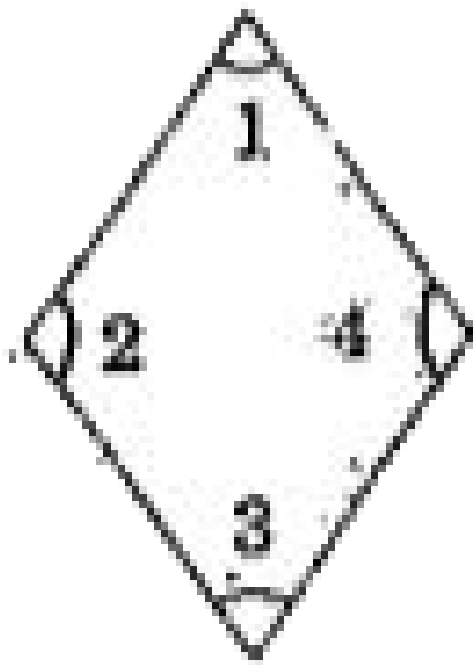


Trapezium



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7. List figure around you and identify the acute, obtuse and right angle found in them,

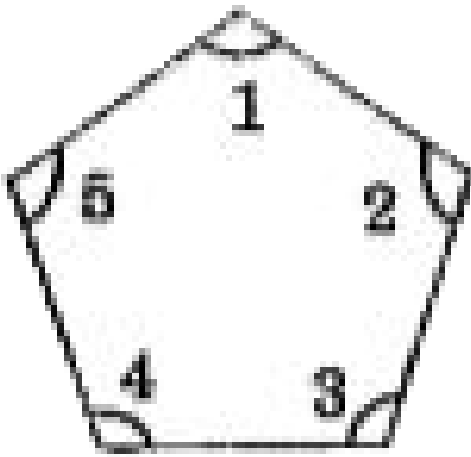


Rhombus



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8. List figure around you and identify the acute, obtuse and right angle found in them,

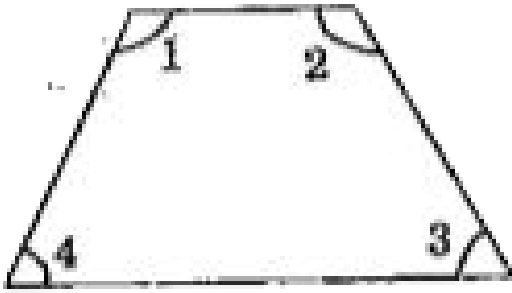


Regular pentagon



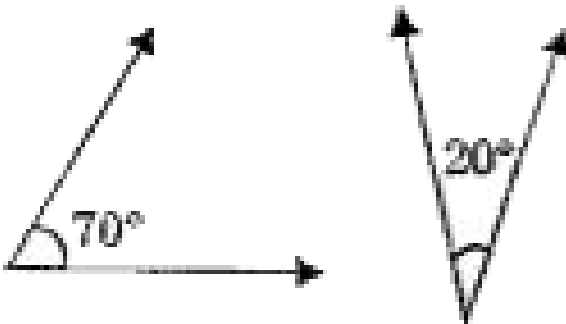
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9. List figure around you and identify the acute, obtuse and right angle found in them,



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10. Which pairs of angle are complementary ?

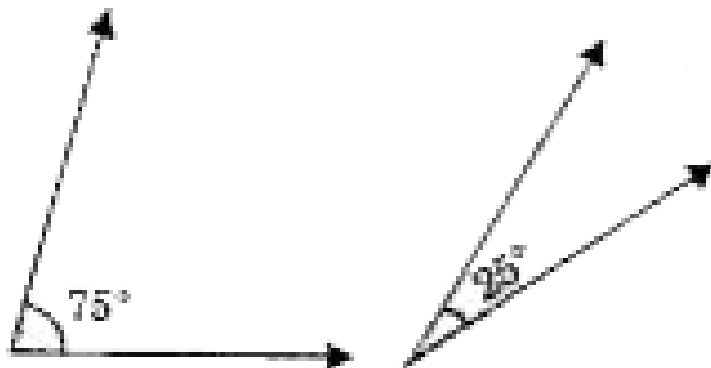


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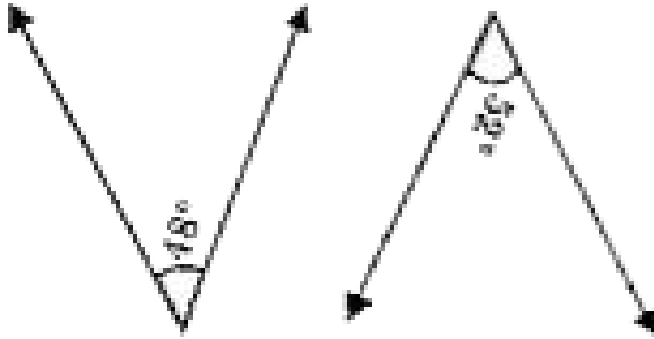
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11. Which pairs of angle are complementary ?



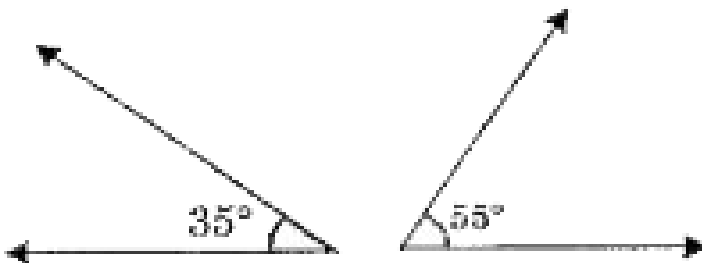
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12. Which pairs of angle are complementary ?



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13. Which pairs of angle are complementary ?





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14. What is the measure of the complement of each of the following angles?

45°



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15. What is the measure of the complement of each of the following angles?

65°





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16. What is the measure of the complement of each of the following angles?

41°



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17. What is the measure of the complement of each of the following angles?

54°

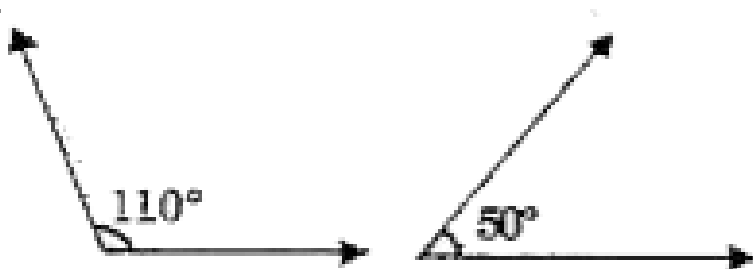


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18. The difference in the measures of two complementary angles is 12° . Find the measures of the angles.

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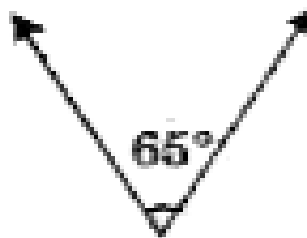
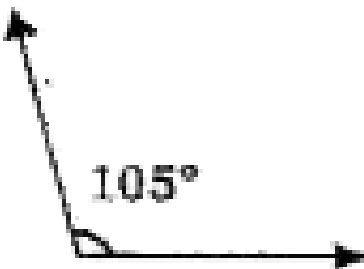
19. Find the pair of supplementary angle in





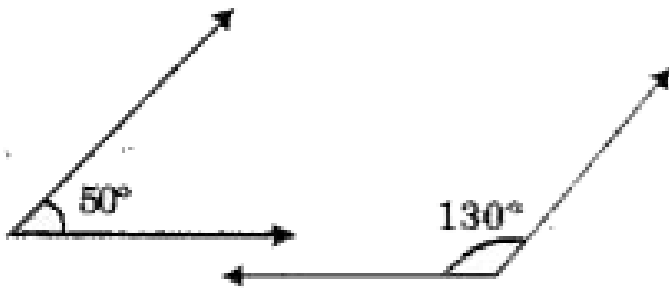
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20. Find the pair of supplementary angle in



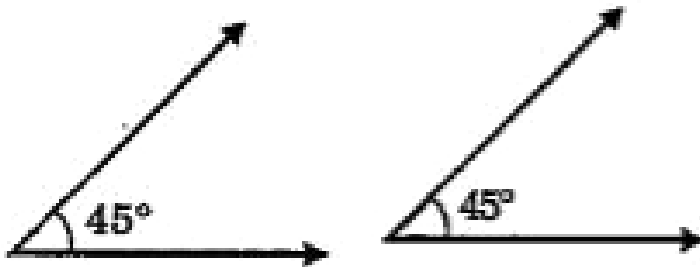
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21. Find the pair of supplementary angle in



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22. Find the pair of supplementary angle in





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23. What will be the measure of the supplement of each one of the following angles?

100°



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24. What will be the measure of the supplement of each one of the following

angles?

90°



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25. What will be the measure of the supplement of each one of the following angles?

55°



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26. What will be the measure of the supplement of each one of the following angles?

125°



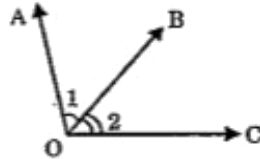
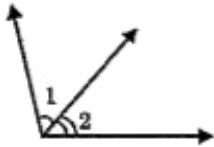
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27. Among the two supplementary angle the measures of the larger angle is 44° more than the measure of the smaller. Find the measures.



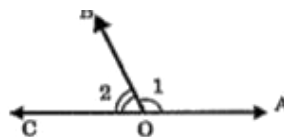
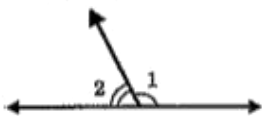
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28. Are the angle marked 1 and 2 adjacent ? If they are not adjacent, say, 'wht'



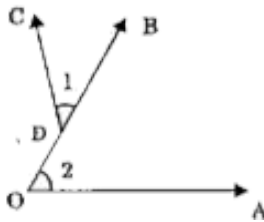
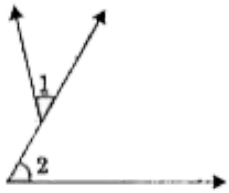
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29. Are the angle marked 1 and 2 adjacent ? If they are not adjacent, say, 'wht'



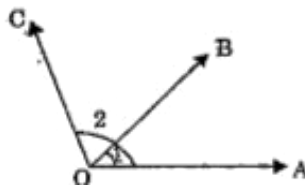
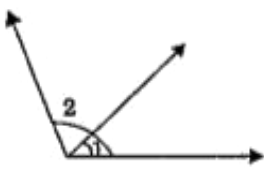
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30. Are the angle marked 1 and 2 adjacent ? If they are not adjacent, say, 'wht'



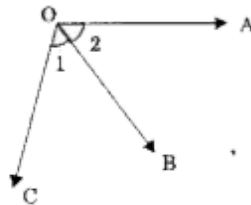
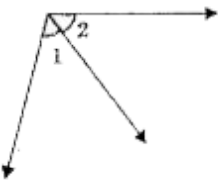
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31. Are the angle marked 1 and 2 adjacent ? If they are not adjacent, say, 'wht'



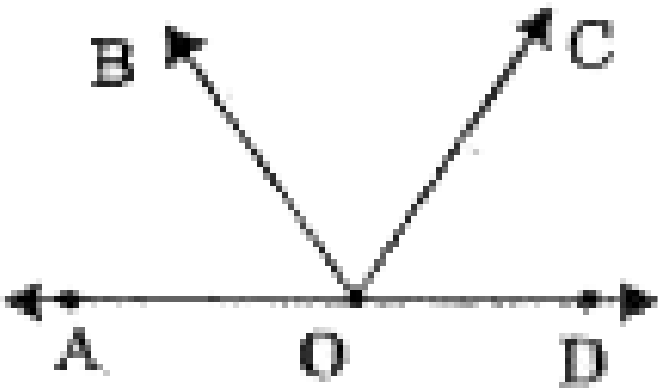
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32. Are the angle marked 1 and 2 adjacent ? If they are not adjacent, say, 'why'



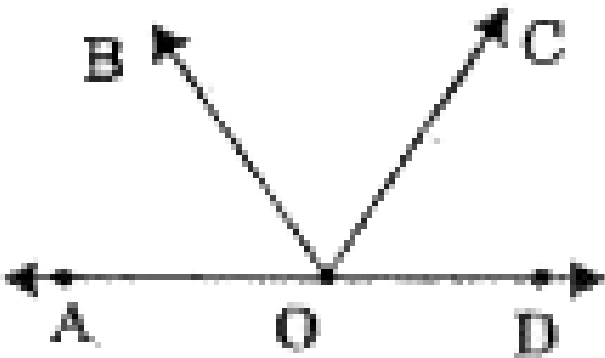
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33. In the given 5.10, $\angle AOB$ and $\angle BOC$ are the adjacent angles ?



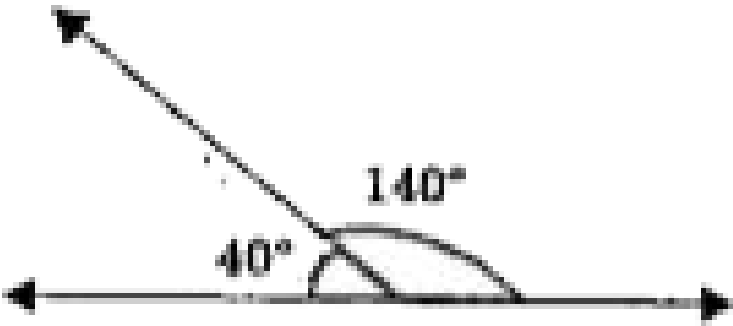
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34. In the given 5.10, $\angle BOD$ and $\angle BOC$ are the adjacent angles ?



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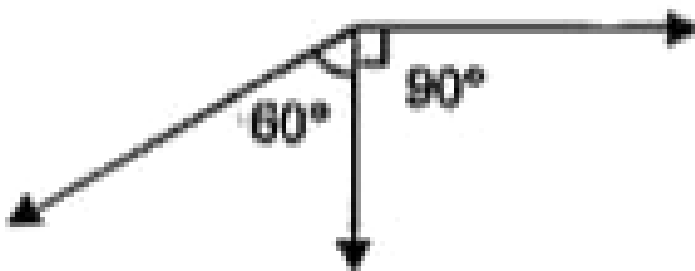
35. Check which of the pair of angle form a linear pair.





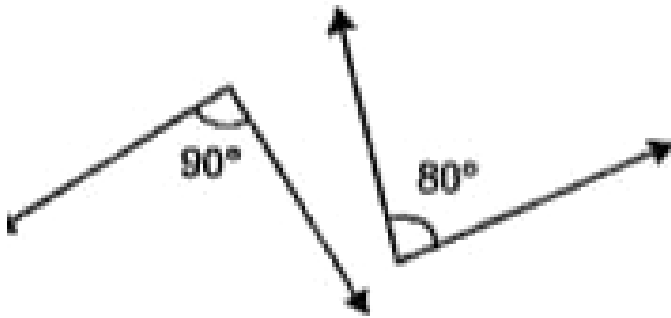
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36. Check which of the pair of angles form a linear pair.



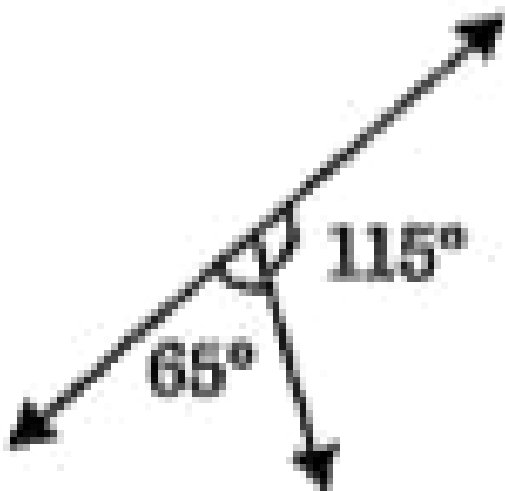
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37. Check which of the pair of angles form a linear pair.



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38. Check which of the pair of angles form a linear pair.



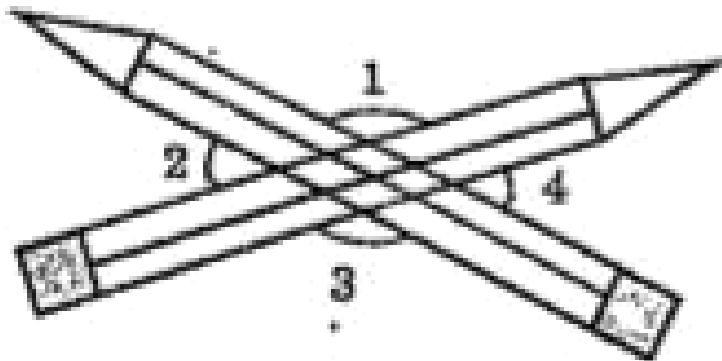
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39. We call $\angle 1$ and $\angle 3$, a pair of vertically opposite angles.

Can you name the other pair of vertically opposite angles ?

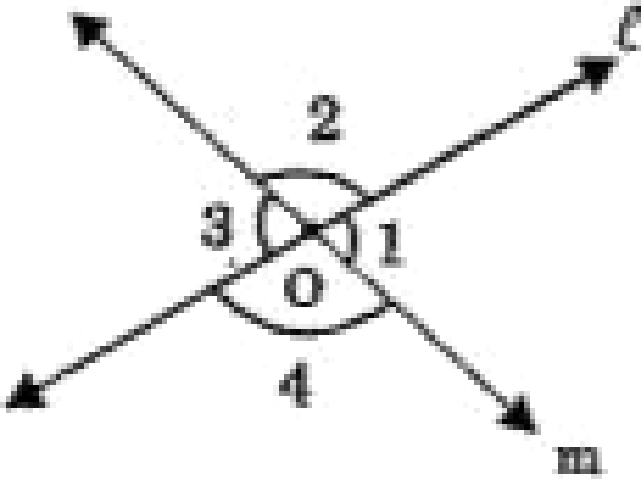
Does $\angle 1$ appear to be equal to $\angle 3$?

Does $\angle 2$ appear to be equal to $\angle 4$?



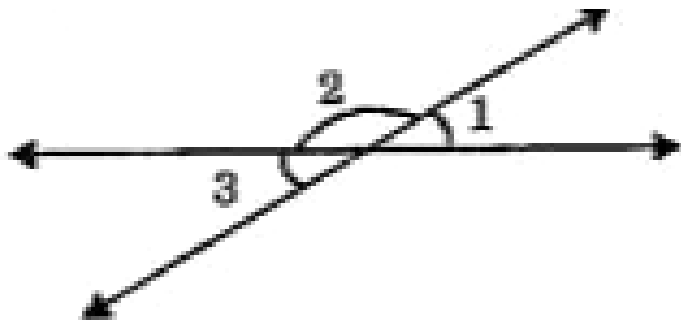
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40. Similarly we can prove that $\angle 2 = \angle 4$



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41. In the given if $\angle 1 = 30^\circ$ find $\angle 2$ and $\angle 3$.



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42. Give an example for vertically opposite angles in your surroundings.

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43. Give an example for vertically opposite angles in your surroundings.



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44. Find examples from your surroundings where lines intersect at right angles.



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45. Find the measures of the angles made by the intersecting lines at the vertices of an equilateral triangle.



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46. Draw any rectangle and find the measures of angles at the four vertices made by the intersecting lines.



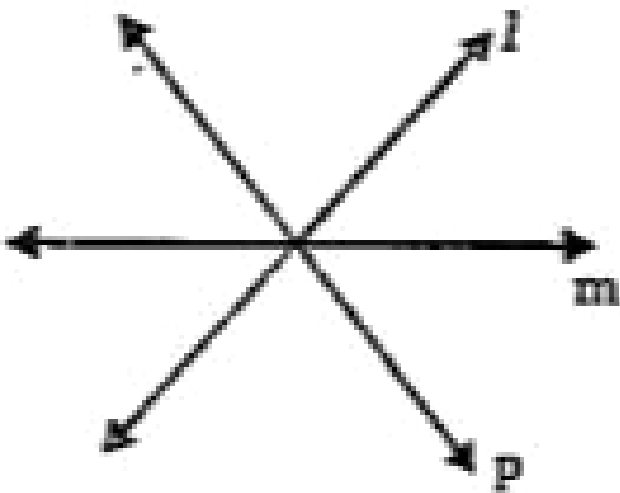
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47. If two lines intersect, do they always intersect at right angles?



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48. the line p is not a transversal , although it cuts two lines l and m . Can you say, 'Why' ?





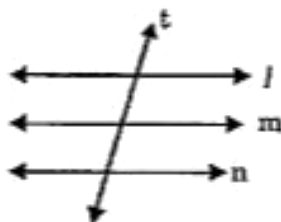
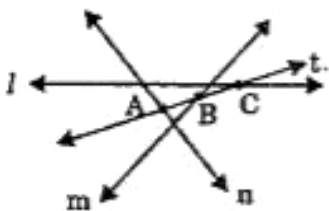
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49. Suppose two lines are given. How many transversals can you draw for these lines.



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50. If a line is a transversal to three lines, how many points of intersection are there ?





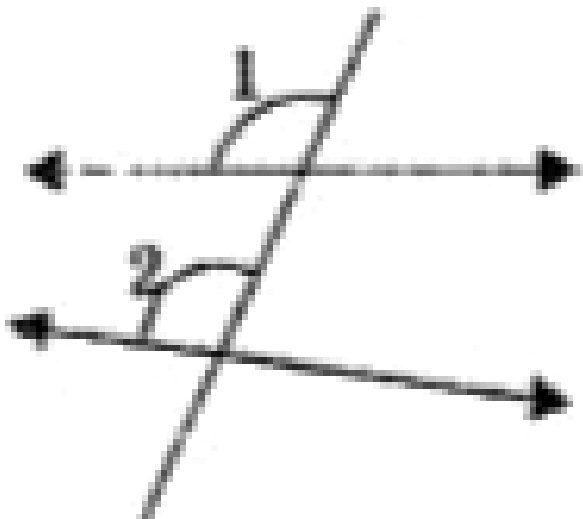
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51. Try to identify a few transversals in your surroundings



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52. Name the pairs of angles each the name in figure



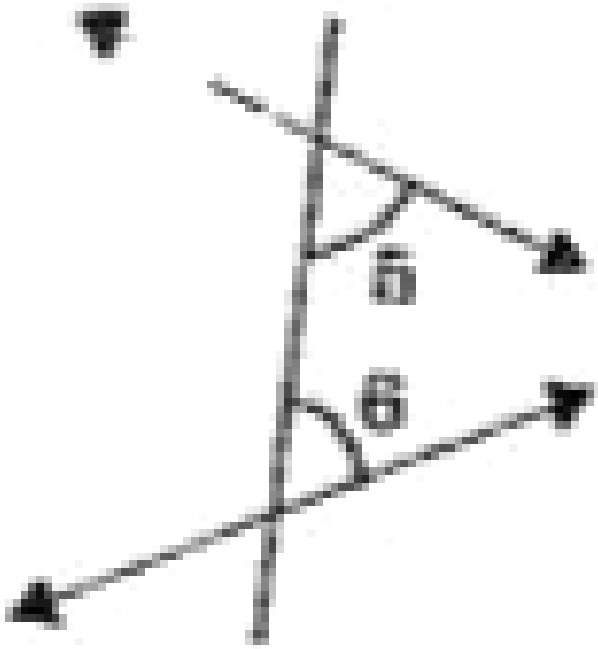
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53. Name the pairs of angles each given in figure



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54. Name the pairs of angles each the name in figure



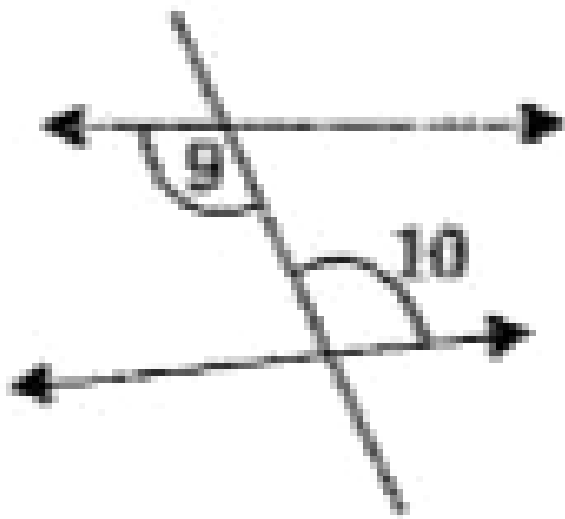
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55. Name the pairs of angles each the name in figure



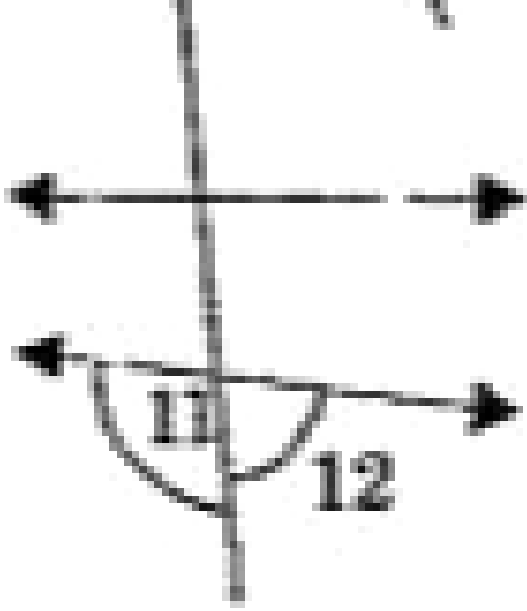
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56. Name the pairs of angles each the name in figure



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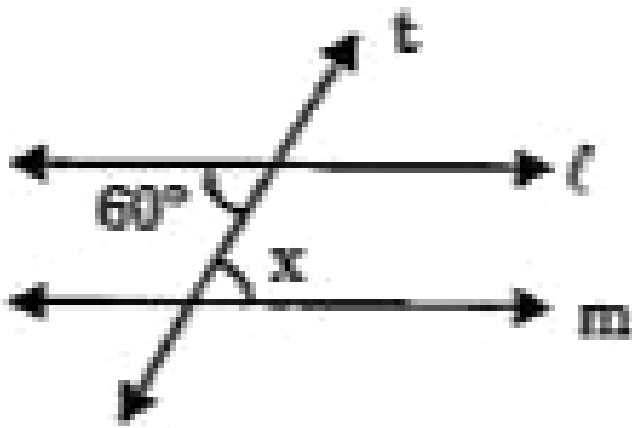
57. Name the pairs of angles each the name in figure



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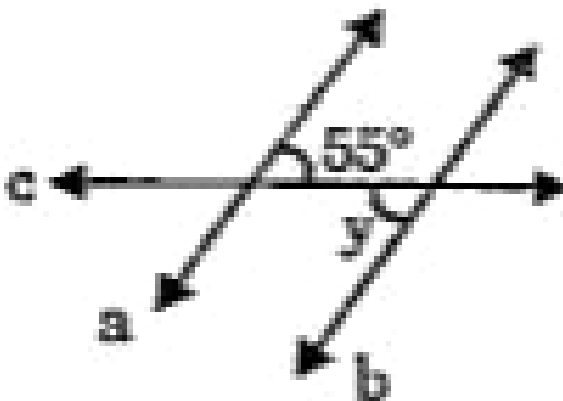
58. Line $l \parallel m$, t is the transversal.

$$\angle x = ?$$



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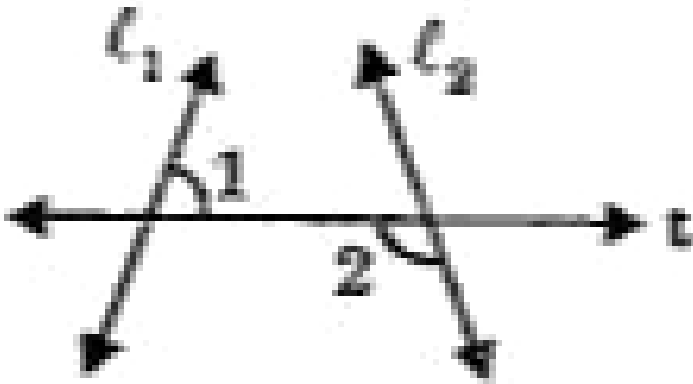
59. Lines $a \parallel b$, c is the transversal $\angle y = ?$





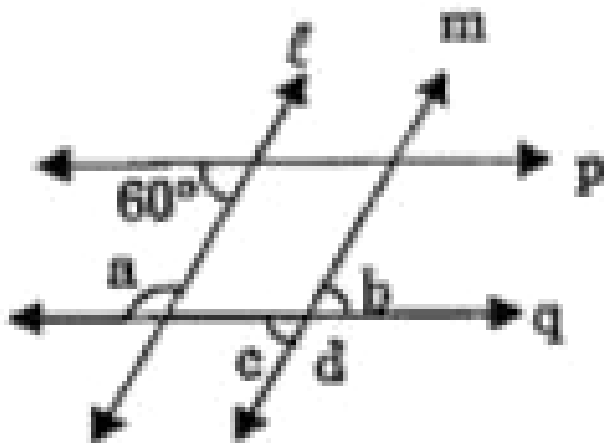
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60. transversal l s $\angle 1 = \angle 2$?



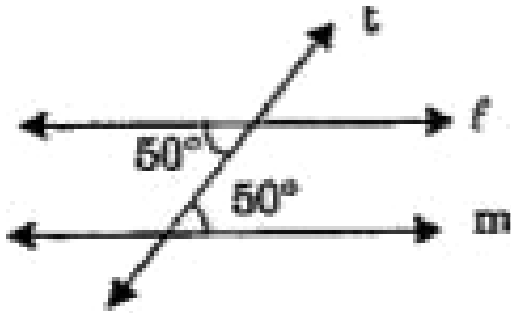
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61. lines $l \parallel m$, $p \parallel q$. Find a, b, c, d



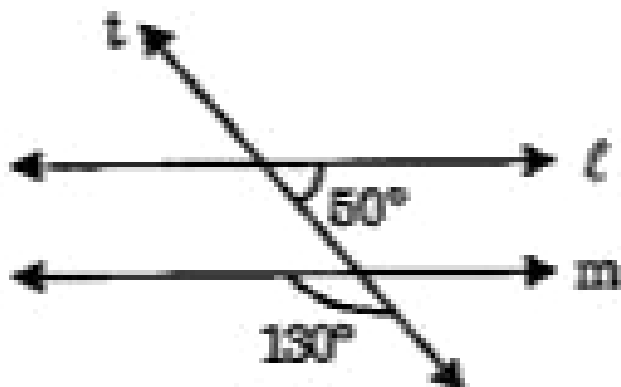
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62. Is $l \parallel m$? Why?



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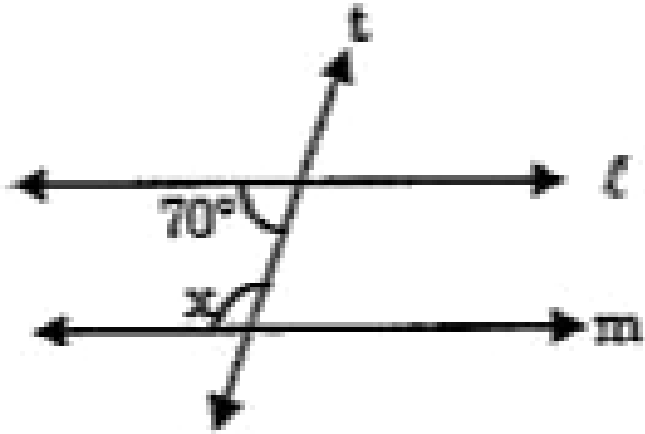
63. If $l \parallel m$, what is $\angle x$?



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64. Since $l \parallel m$, cut by transversal t then interior angles on the same side of

transversal are supplementary.



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Think Discuss And Write

1. Can two acute angles be complement to each other?



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2. Can two obtuse angles be complement to each other?



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3. Can two right angles be complement to each other?



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4. Can two obtuse angles be supplementary?



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5. Can two acute angles be supplementary?



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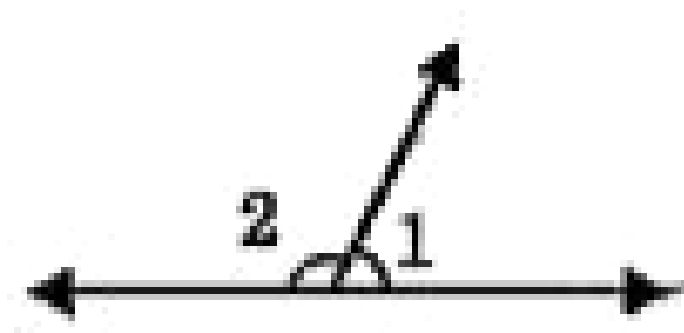
6. Can two right angles be supplementary?



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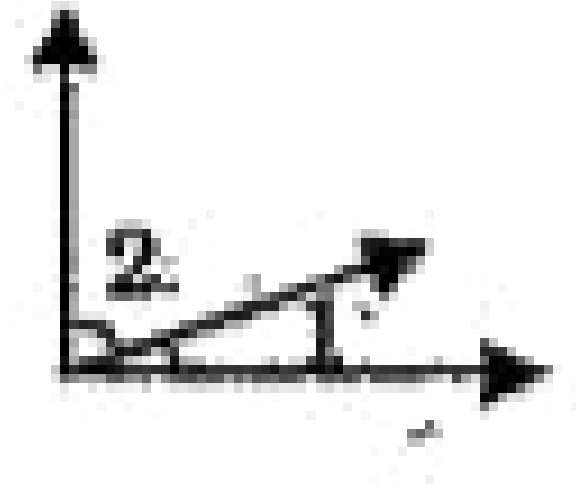
7. Can two adjacent angles be supplementary

?



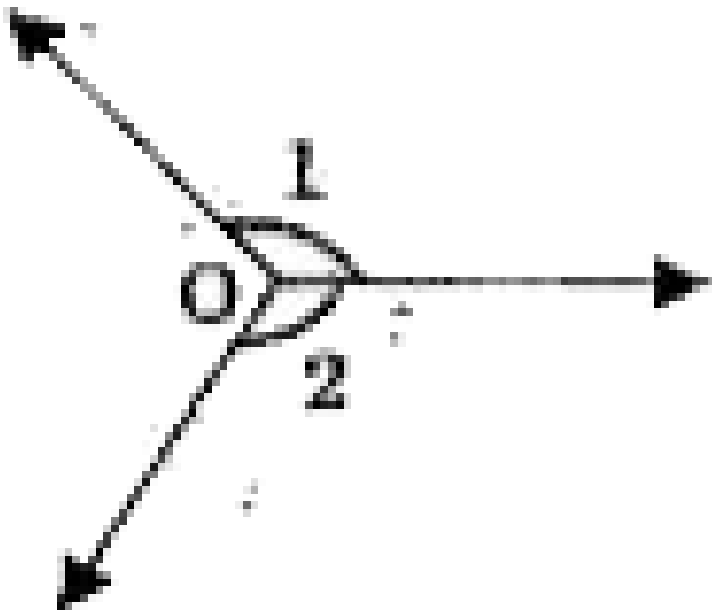
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8. Can two adjacent angles be complementary?



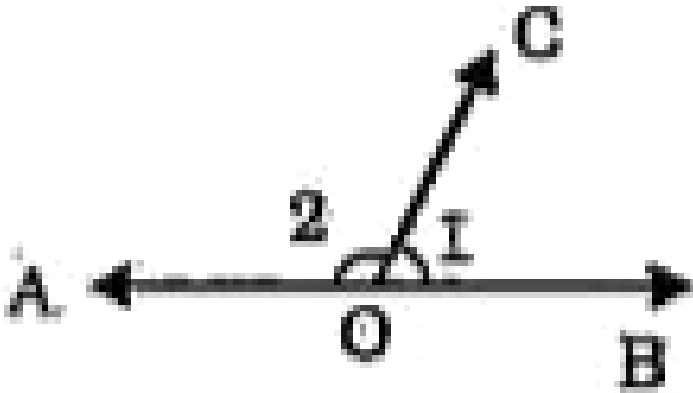
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9. Can two obtuse angles e adjacent angles ?



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10. Can an acute angle be adjacent to an obtuse angle?



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11. Can two acute angles form a linear pair?

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12. Can two obtuse angles form a linear pair?



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13. Can two right angles form a linear pair?

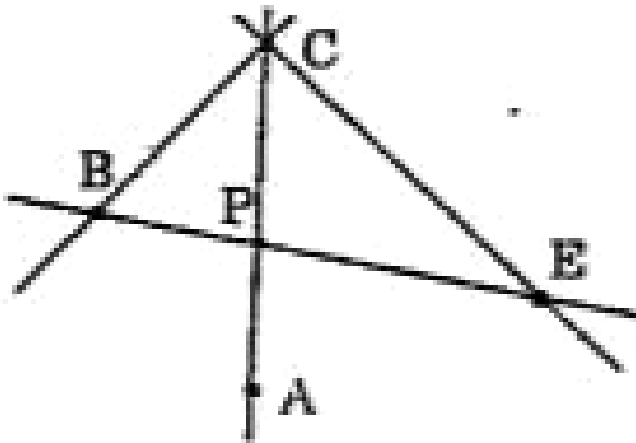


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14. 5.20, AC and BE intersect at P. AC and BC intersect at C. AC and EC intersect at C. Try to

find another ten pairs of intersecting line segments. Should any two lines or line segments necessarily intersect? Can you find two pairs of non-intersecting line segments in the figure?

Can two lines intersect in more than one point? Think about it.



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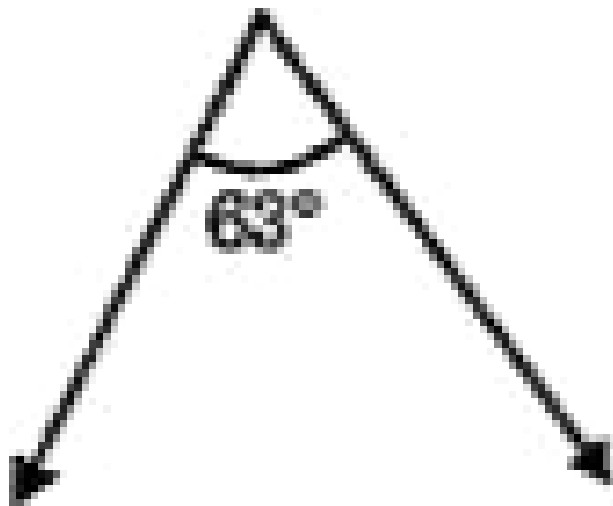
Exercises 5 1

1. Find the complement of each of the angle



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2. Find the complement of each of the angle



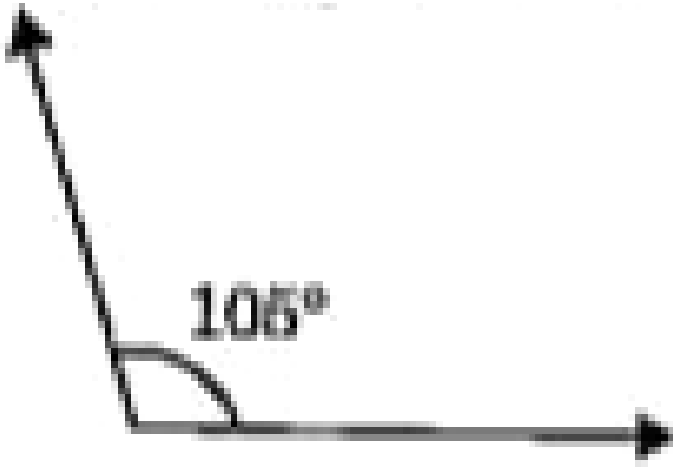
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3. Find the complement of each of the angle



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4. Find the supplement of each of the angle.



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5. Find the supplement of each of the angle.



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6. Find the supplement of each of the angle.





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7. Identify which of the following pairs of angles are complementary and which are supplementary.

65° , 115°



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8. Identify which of the following pairs of angles are complementary and which are

supplementary.

63° , 27°



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9. Identify which of the following pairs of angles are complementary and which are supplementary.

112° , 68°



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10. Identify which of the following pairs of angles are complementary and which are supplementary.

$130^\circ, 50^\circ$



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11. Identify which of the following pairs of angles are complementary and which are supplementary.

$45^\circ, 45^\circ$





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12. Identify which of the following pairs of angles are complementary and which are supplementary.

$80^\circ, 10^\circ$



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13. Find the angle which is equal to its complement.



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14. Find the angle which is equal to its supplement.



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15. In the given figure, $\angle 1$ and $\angle 2$ are supplementary angles.

If $\angle 1$ is decreased, what changes should take place in $\angle 2$ so that both the angles still

remain supplementary.



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16. Can two angles be supplementary if both of them are:
acute?



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17. Can two angles be supplementary if both of them are:
obtuse?



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18. Can two angles be supplementary if both of them are:
right?



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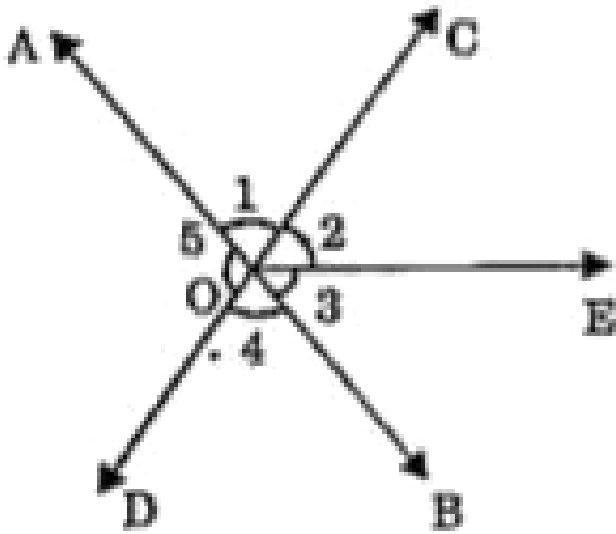
19. An angle is greater than 45° . Is its complementary angle greater than 45° or equal to 45° or less than 45° ?



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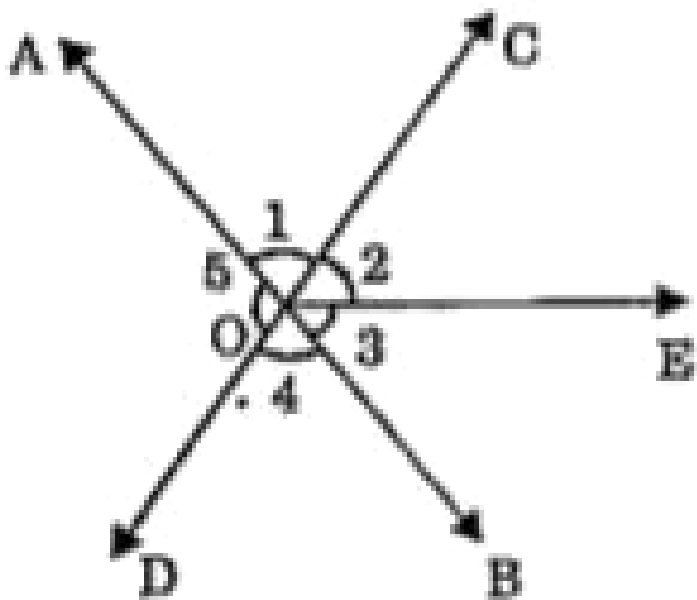
20. In the adjoining Is

$\angle AOC$ adjacent $\rightarrow \angle AOE$



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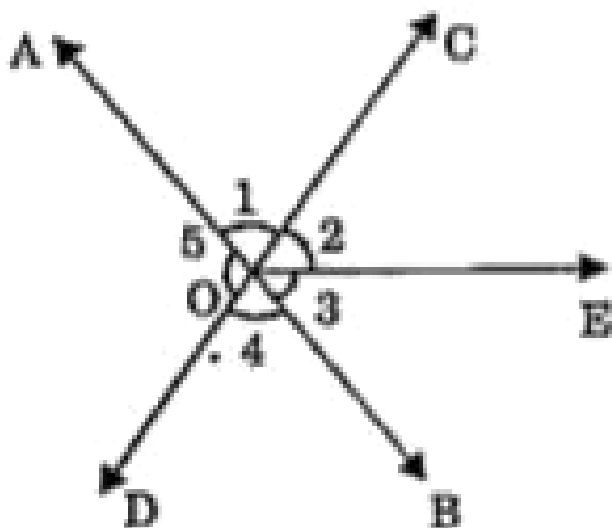
21. In the adjoining Is $\angle 1$ adjacent to $\angle 2$



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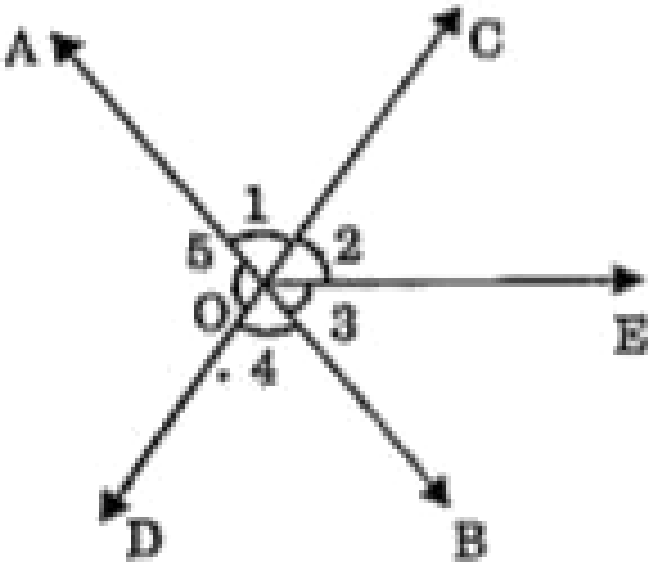
22. In the adjoining Is $\angle 1$ vertically opposite to

$\angle 4$



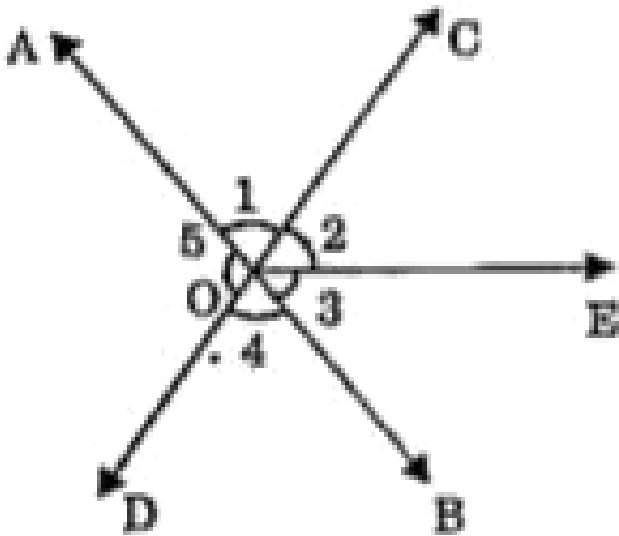
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23. In the adjoining` Do angleCOE and angleEOD form a linear pair?



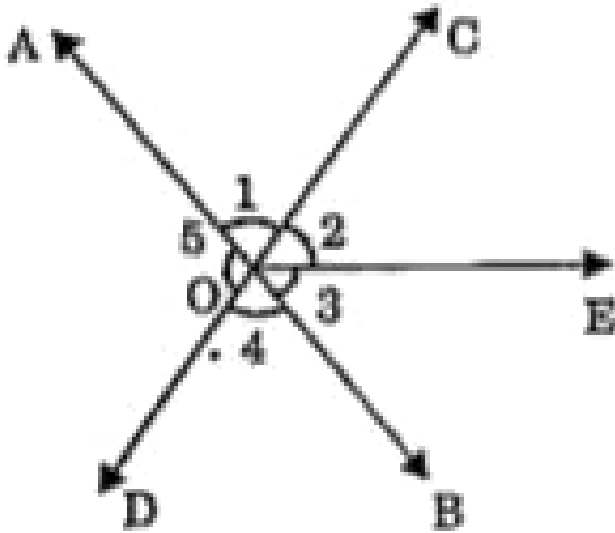
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24. In the adjoining` Are angle BOD and angleDOA supplementary



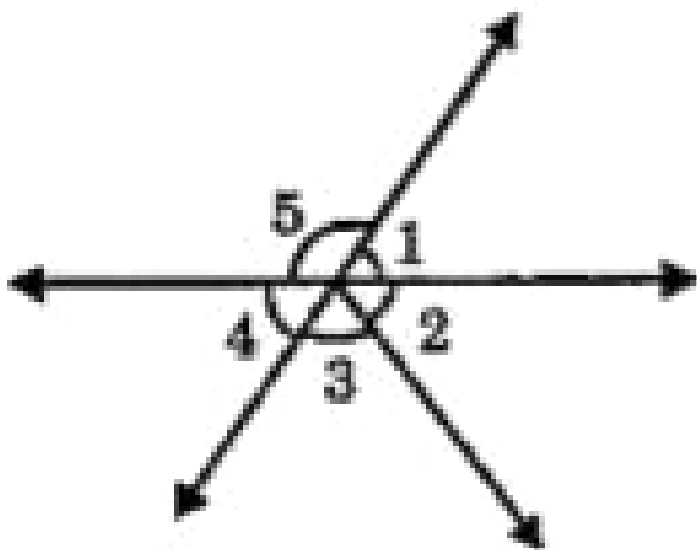
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25. In the adjoining What is the vertically opposite angle of $\angle 5$



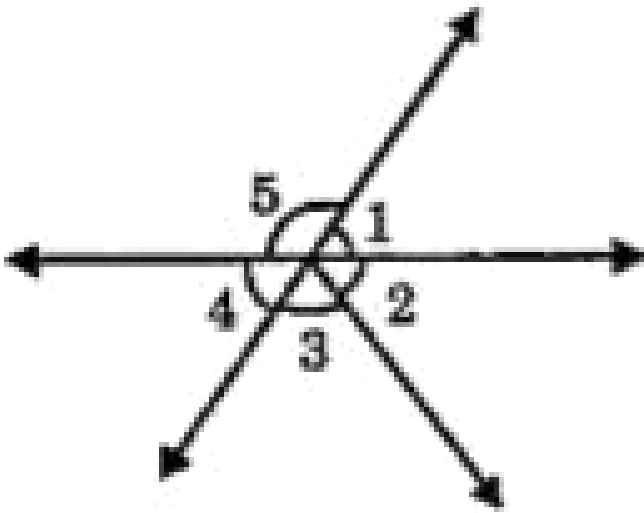
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26. Indicate which pair of angle are form linear pair



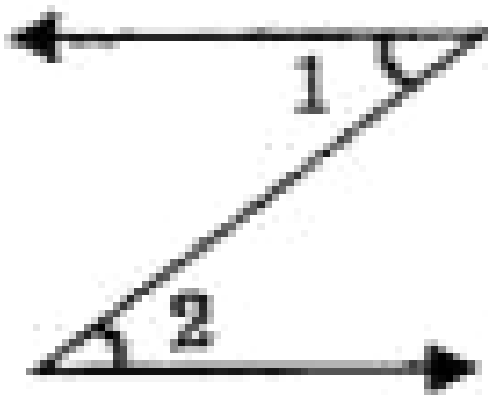
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27. Indicate which pair of angle are vertically opposite angles.



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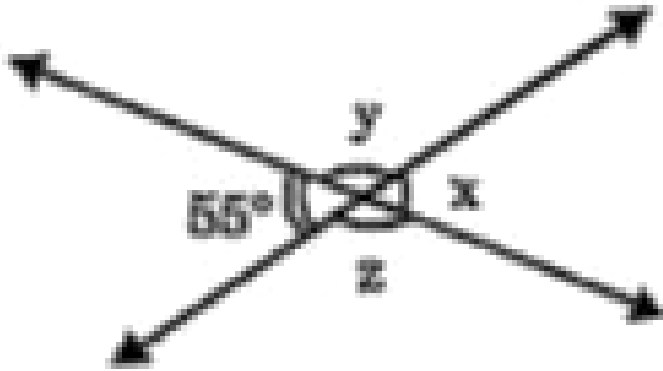
28. In the following is $\angle 1$ adjacent to $\angle 2$? Give reason.



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29. Find the values of the angle x, y and z in each of the following

\therefore the two lines intersect, so pair of opposite angles are equal

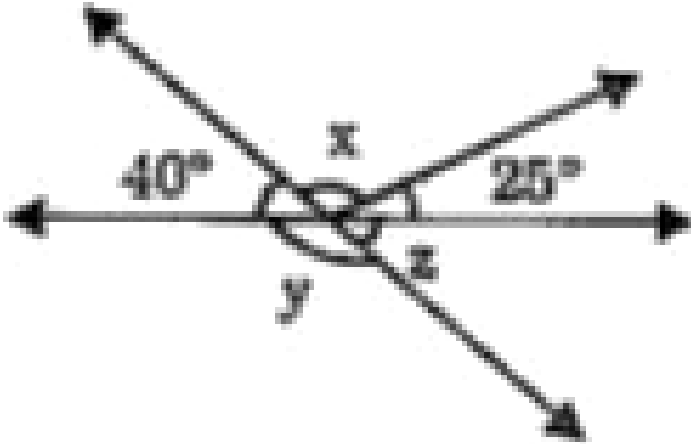


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30. Find the values of the angle x, y and z in each of the

In the given

$$40^\circ + x^\circ + 25^\circ = 180^\circ$$



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31. Fill in the blanks:

If two angles are complementary, then the sum of their measures is _____.



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32. Fill in the blanks:

If two angles are supplementary, then the sum of their measures is _____.



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33. Fill in the blanks:

Two angles forming a linear pair are _____.



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34. Fill in the blanks:

If two adjacent angles are supplementary, they form a _____.



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35. Fill in the blanks:

If two lines intersect at a point, then the vertically opposite angles are always _____.



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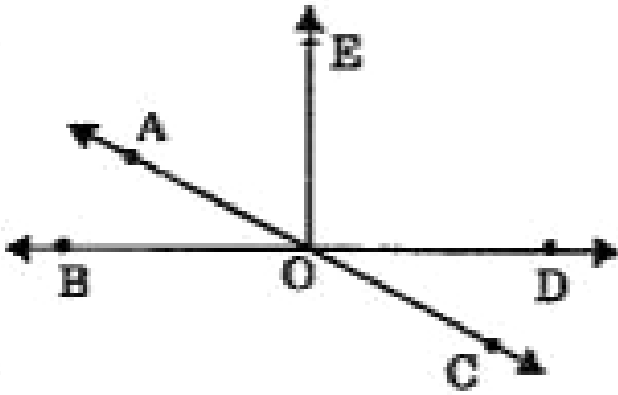
36. Fill in the blanks:

If two lines intersect at a point, and if one pair of vertically opposite angles are acute angles, then the other pair of vertically opposite angles are _____.



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37. In the adjoining name the pair of angles

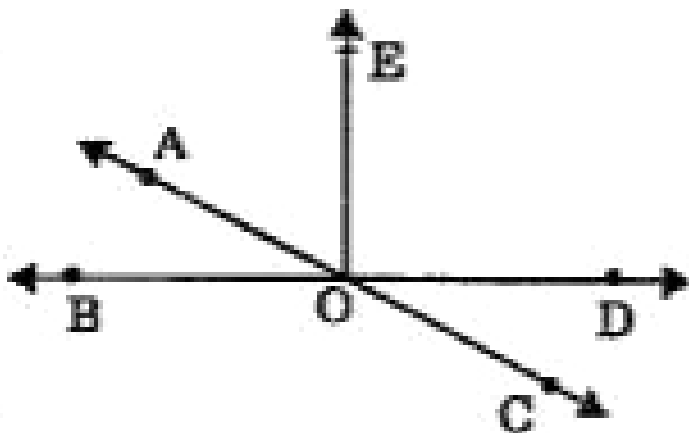


Obtuse vertically opposite angle



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38. In the adjoining name the pair of angles

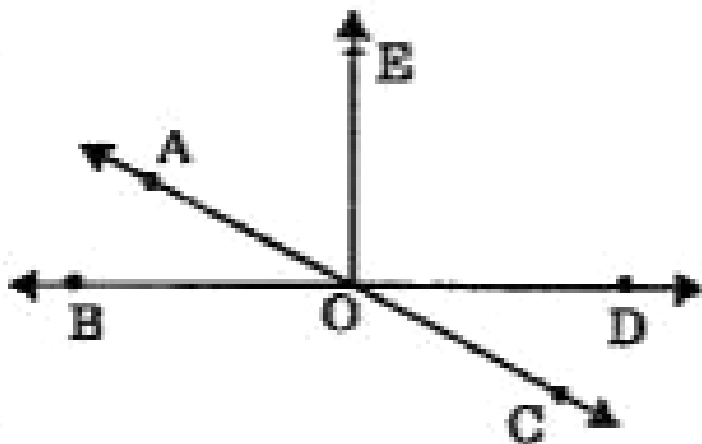


Obtuse vertically opposite angle



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39. In the adjoining name the pair of angles

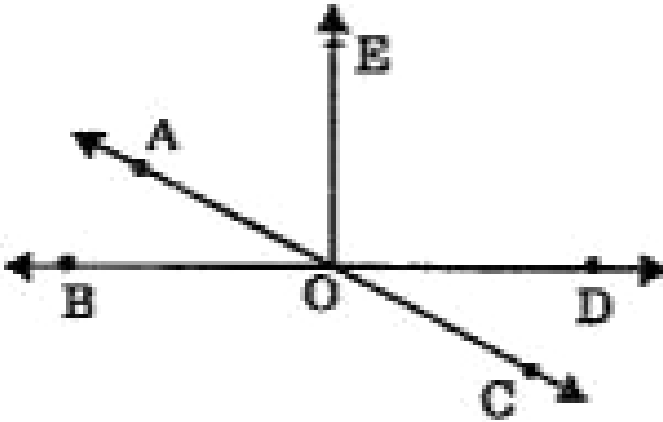


Obtuse vertically opposite angle



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40. In the adjoining name the pair of angles

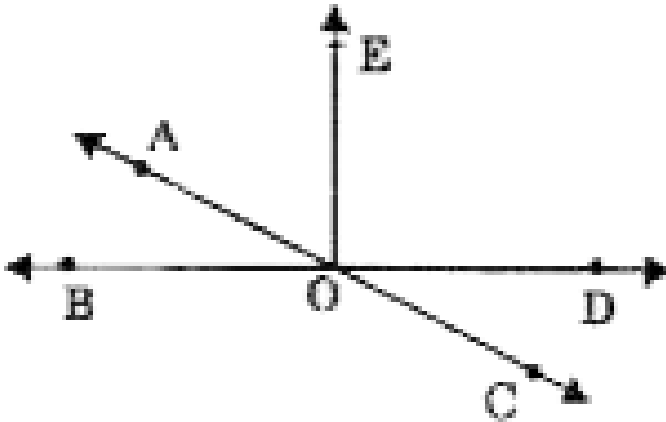


Obtuse vertically opposite angle



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41. In the adjoining name the pair of angles



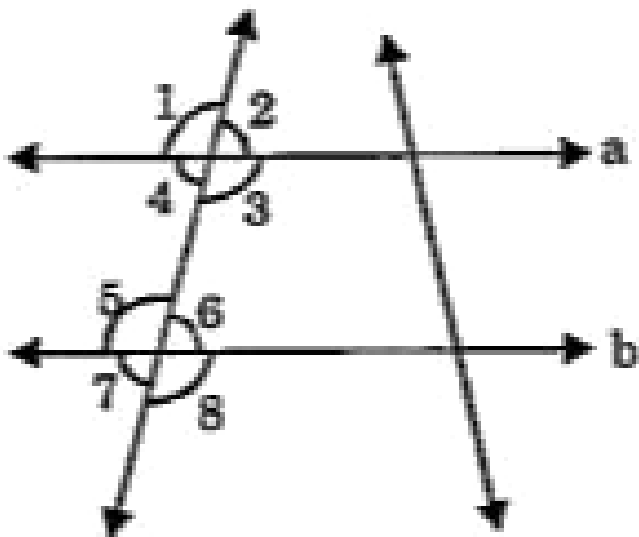
Adjacent complementary angle



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Exercises 5 2

1. State the property that is used in each of the statement ?

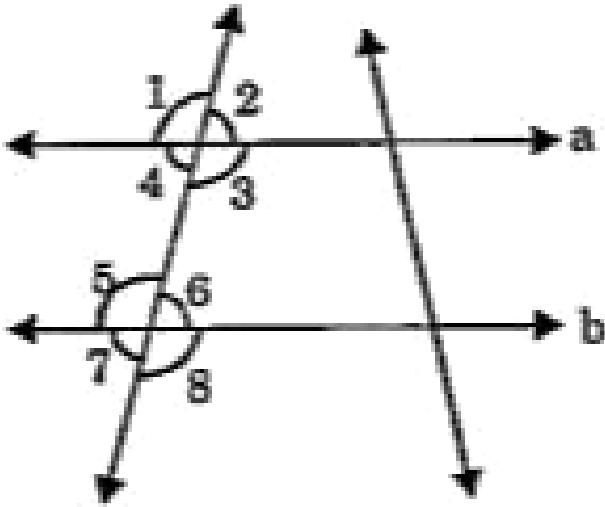


If $a \parallel b$ then $\angle 1 = \angle 5$.



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2. State the property that is used in each of the statement ?

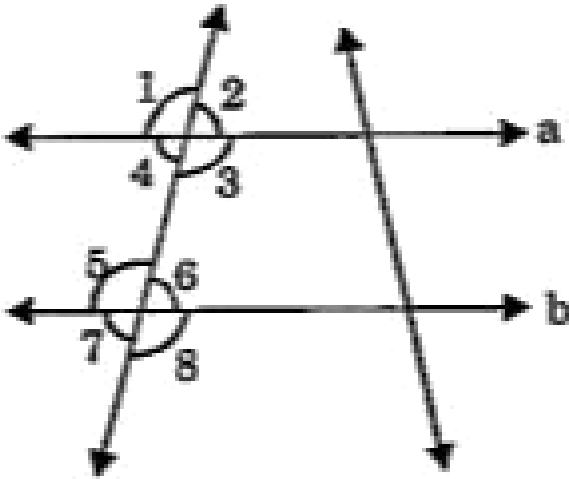


If $\angle 4 = \angle 6$ then $a \parallel b$



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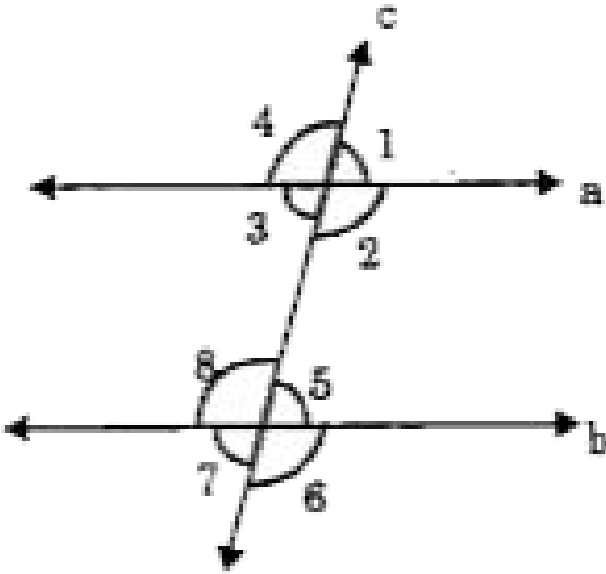
3. State the property that is used in each of the statement ?



If $\angle 4 + \angle 5 = 180^\circ$, then $a \parallel b$.

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4. In the adjoining identify

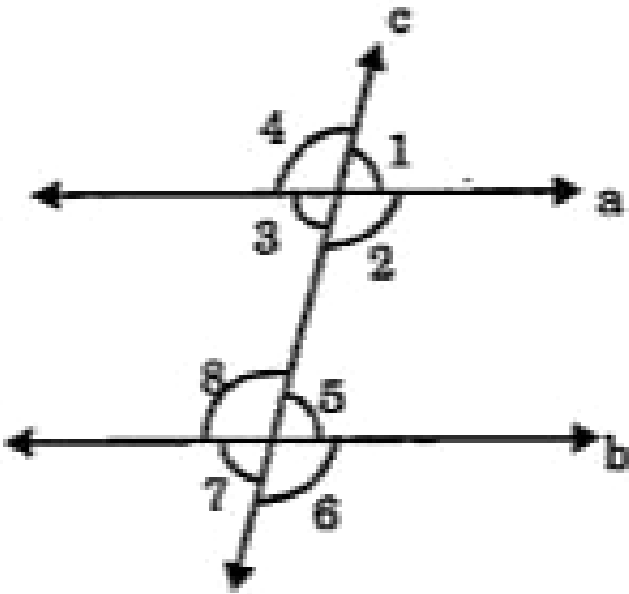


the pair of alternate interior angles.



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5. In the adjoining identify

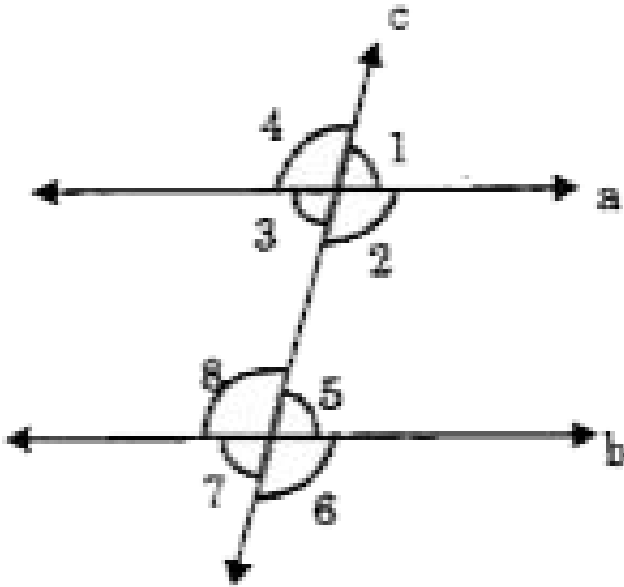


the pairs of alternate interior angles.



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6. In the adjoining identify

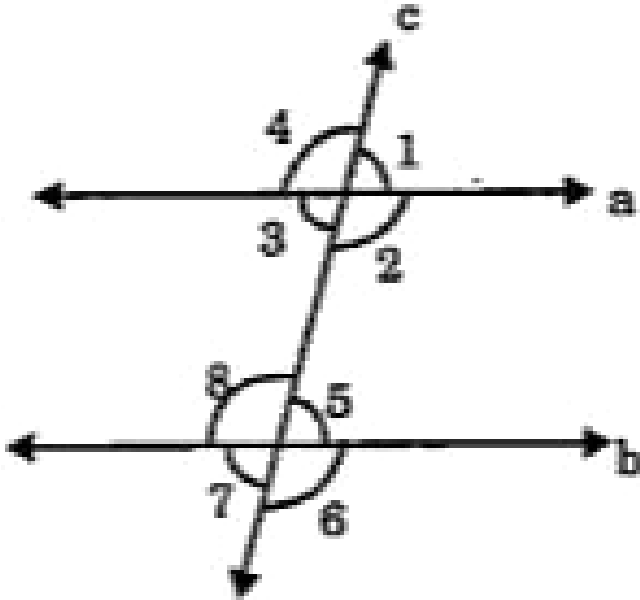


the pair of interior angles on the same side of the transversal.



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7. In the adjoining identify

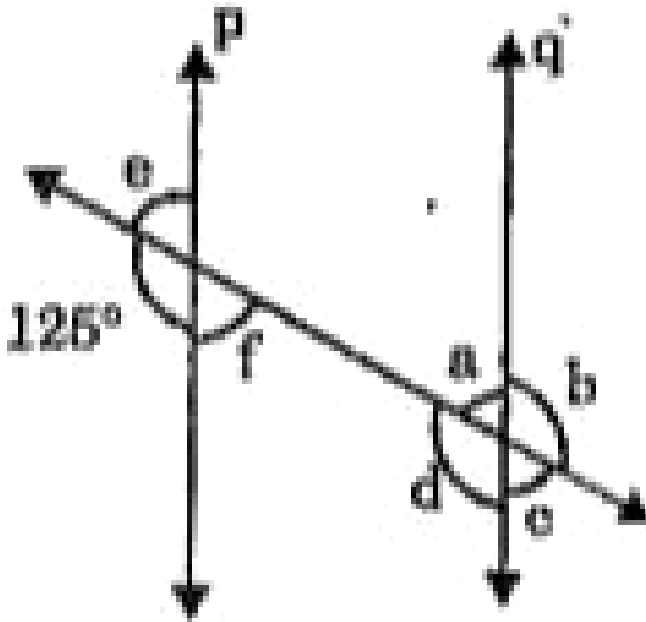


the vertically opposite angles.



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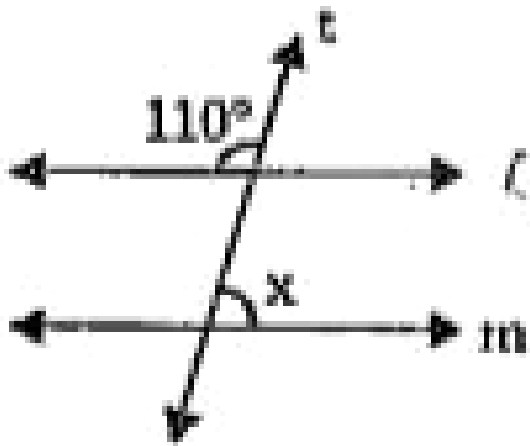
8. In the adjoining $p \parallel q$. Find the unknown angles.



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9. Find the value of x in each of the figure is |||

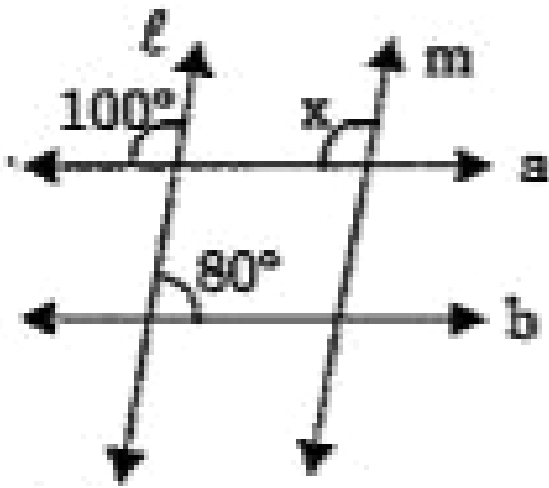
m



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10. Find the value of x in each of the figure is |||

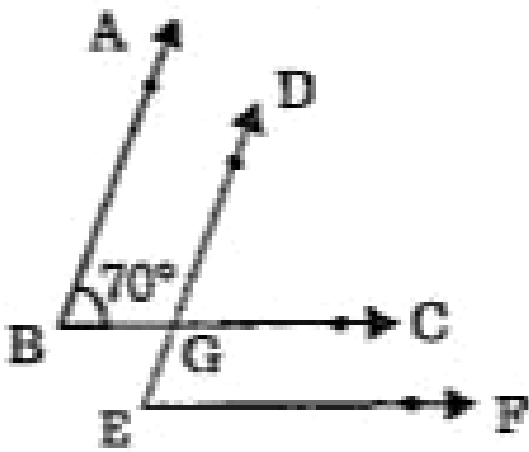
m



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11. In the given the arms of two angles are parallel

If $\angle ABC = 70^\circ$ then find

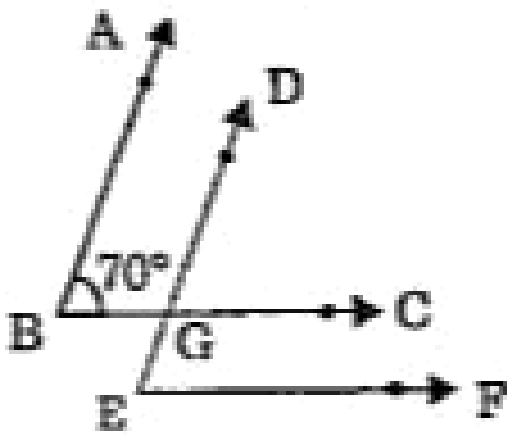


$\angle DGC$

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12. In the given the arms of two angles are parallel

If $\angle ABC = 70^\circ$ then find

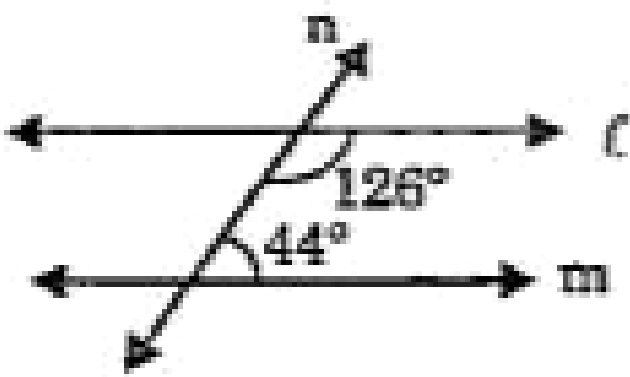


$\angle DEF$



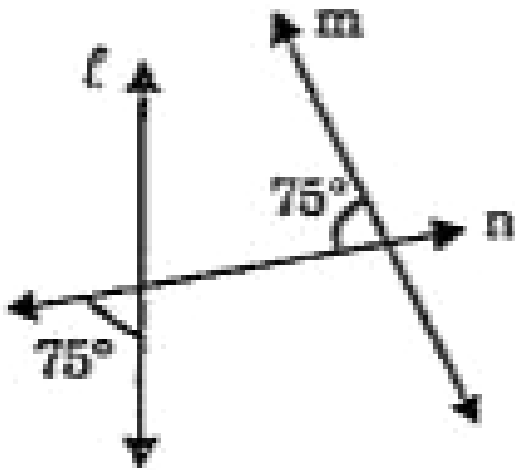
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13. In the given below, decide whether l is parallel to m



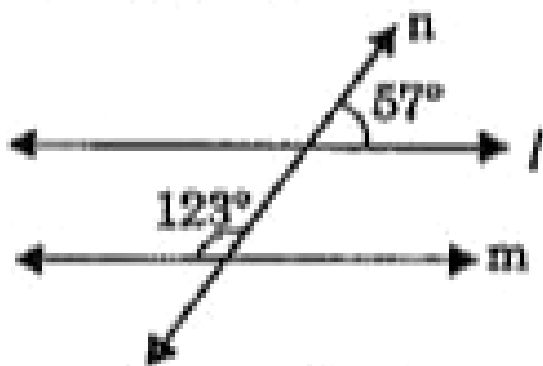
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14. In the given below, decide whether l is parallel to m



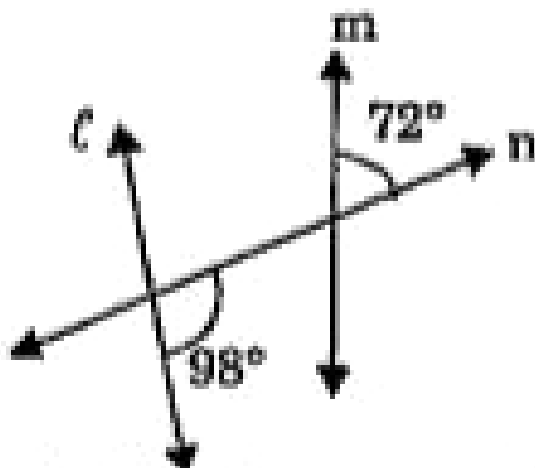
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15. In the given below, decide whether l is parallel to m



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16. In the given below, decide whether l is parallel to m





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Additional Questions For Practice

1. If two lines intersect, then vertically opposite angles are..... .



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2. Two complementary angles whose difference is 30° are _____ and _____



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3. When two lines intersect, the vertically opposite angles so formed are _____



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4. Two complementary angles whose difference is 30° are _____ and _____



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5. _____ pairs of interior alternate angles are formed when two parallel lines are intersected by a transversal.



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6. Pair of vertically opposite angles are _____



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7. State whether true or false

Two angles forming a linear pair are

complementary



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8. State whether true or false

Angles 70° , 110° are supplementary angles.



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9. Can two acute angles form a linear pair?



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10. State whether true or false

Pair of vertically opposite angles are supplementary



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11. State whether true or false

Adjacent angles have common arm, common vertex, interior do not overlap.



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12. State whether true or false

If transversal marks equal corresponding angles with two given lines then the two lines parallel



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**Additional Questions For Practice Short Answer
Type Questions**

1. Match the following

- | | | |
|---|---|---|
| (a) Two non-intersecting lines | - | 88° |
| (b) 38°, 52° | - | Angles in a linear pair |
| (c) Supplement of 92° | - | 90° |
| (d) Angle formed between North and East | - | Measure of angle between two parallel lines |
| (e) 180° | - | Complementary angles |
| (f) Zero degree | - | Parallel |



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2. The ratio of two supplementary angles is 1:3. Find the measures of angles.



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3. One of the angles forming a linear pair is $7x + 26^\circ$ and the other angle is 42° . Find the measure of unknown angles.



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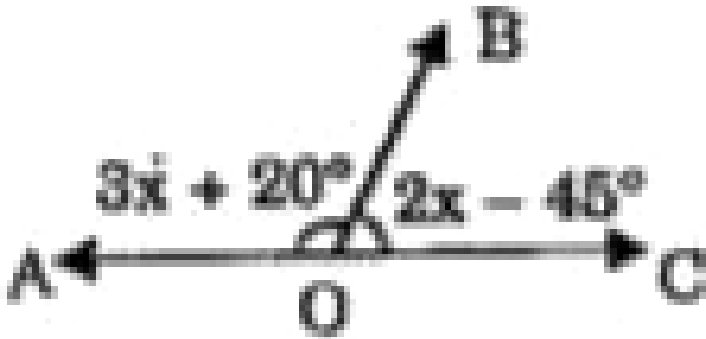
4. An angle is $\frac{1}{3}$ its complement . What are measures of the angles ?



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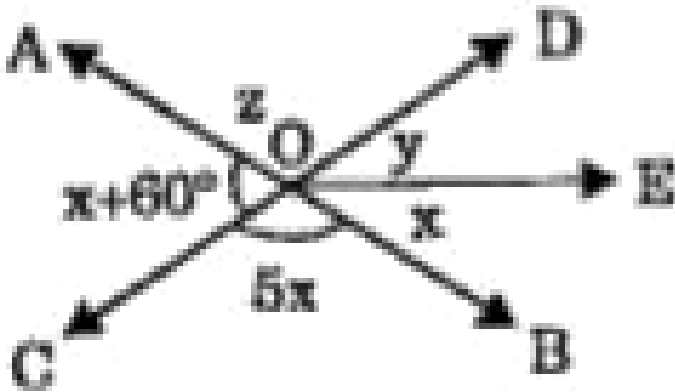
Additional Questions For Practice Long Answer Type Questions

1. $\angle AOB$ and $\angle BOC$ represent the linear pair of angles. Find the measures of the angle.



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2. In the adjoining find the measures of $\angle x$, $\angle y$, $\angle z$



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3. If two angles are complementary. If one is 6° more than three times the other. Find the

angles.



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Additional Questions For Practice Hots

1. In the adjoining arrows depict the pair of parallel lines. Find the measures of unknown angles.





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Sample Paper For Practice

1. Fill in the blank

In complementary angle one angle is 48° ,
then the other angle is.....



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2. Fill in the blank

The sum of the degree measures of the supplementary angles and complementary angles differ by



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3. Fill in the blank

..... pairs of corresponding angles are formed when two parallel lines are intersected by transversal.





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4. Fill in the blank

Two adjacent angles whose sum is 180° are

.....



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5. Fill in the blank

Two non-intersecting lines are always



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6. Fill in the blank

Vertically opposite angles have a common



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7. Correct the statements given below:

Supplement of obtuse angle is obtuse.



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8. Correct the statements given below:

Two angles are complementary if there sum is 180° .



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9. Correct the statements given below:

Angle equal to its complement is 90° .



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10. Correct the statements given below:

Adjacent angles may or may not form a linear pair



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11. Correct the statements given below:

Parallel lines on extending meet at a point.



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12. Correct the statements given below:

Angle formed between North and South direction is a right angle.



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13. Answer the following:

if the sum of two vertically opposite angle is 120° , then, what is the measure of each angle?



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14. Answer the following:

Can two angles be complementary? Draw figures to justify.



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15. Suppose two lines are given. How many transversals can you draw for these lines.

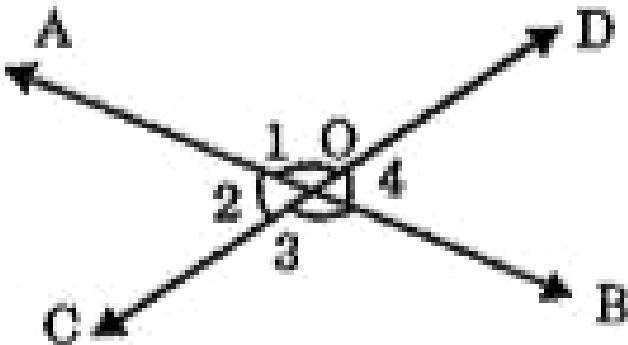


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16. Lines AB and CD intersect at O

i. e. $\angle 2 + \angle 4 = 112^\circ$.

What is the measure of $\angle 1$.



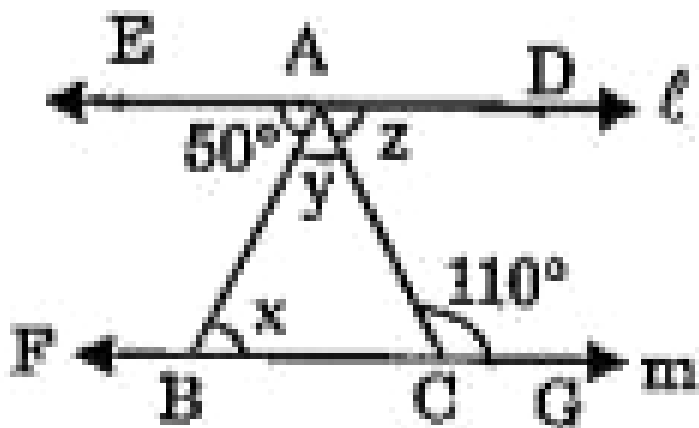
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17. What is the measure of angle which is 45°

less than twice its supplement ?

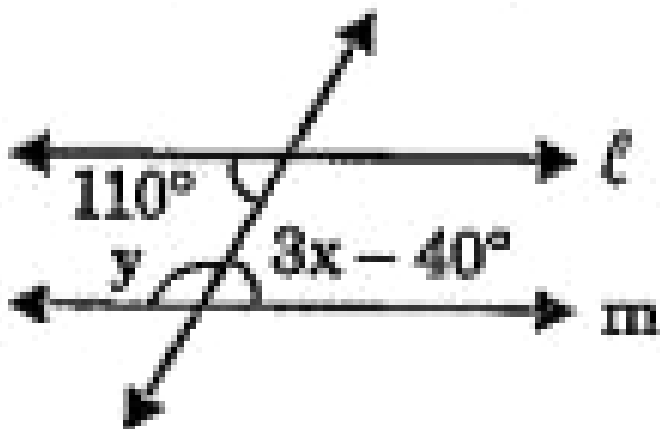
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18. In the adjoining find the measure of $\angle x$, $\angle y$, $\angle z$.



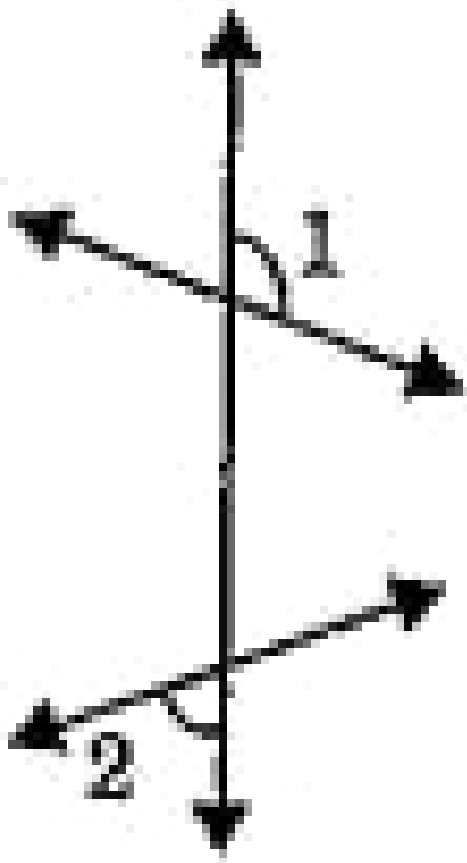
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19. Lines $l \parallel m$ is cut by rransersal 't'. Find the value of x and y .



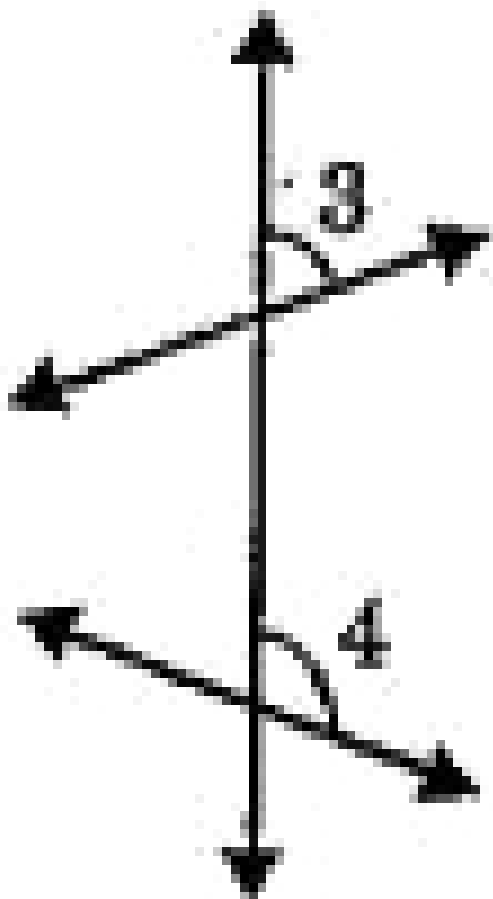
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20. Name the pairs of angles



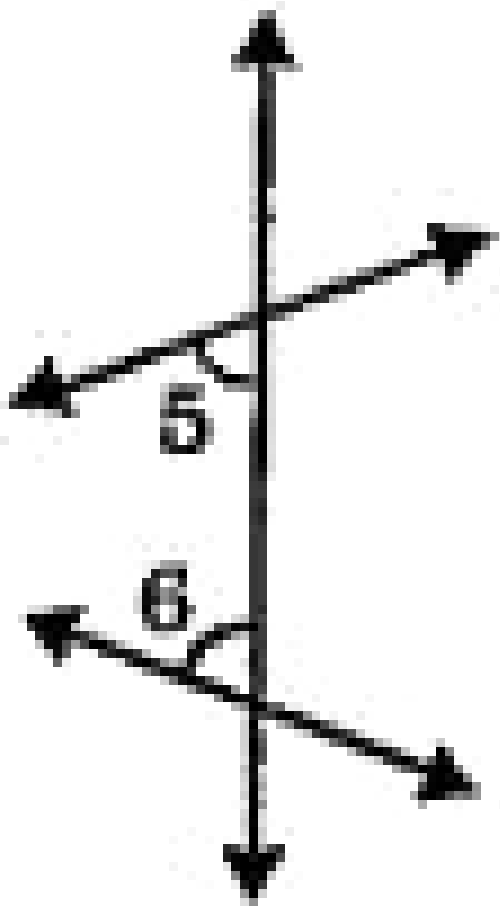
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21. Name the pairs of angles



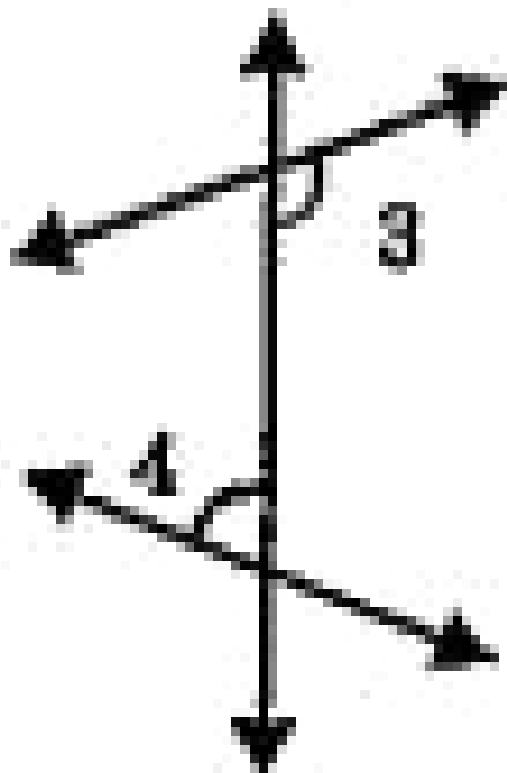
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22. Name the pairs of angles



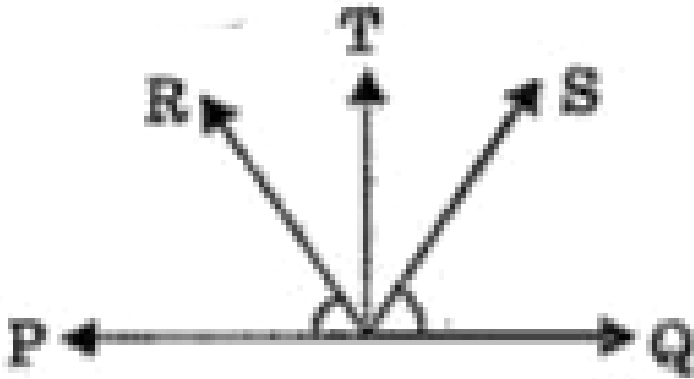
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23. Name the pairs of angles



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24. Observe the and complete the statement

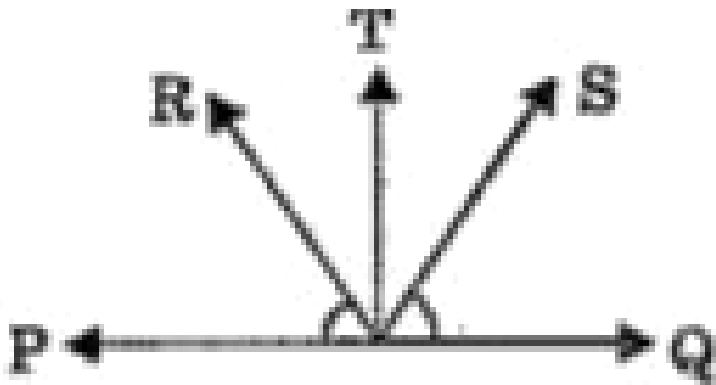


$\angle POR$ and $\angle ROS$ are a pair of



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25. Observe the and complete the statement

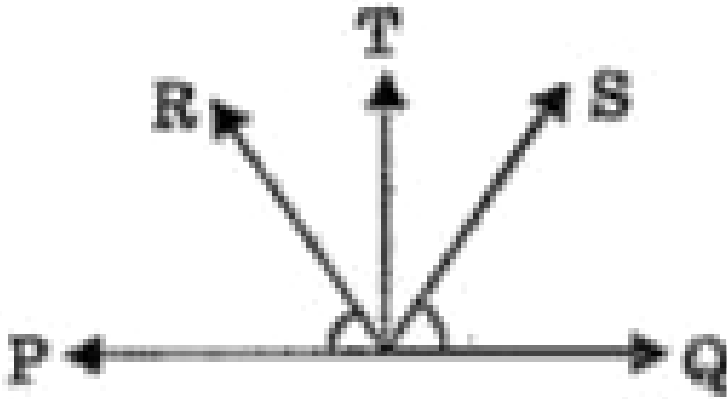


$\angle POR$ and $\angle ROQ$ are



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26. Observe the and complete the statement

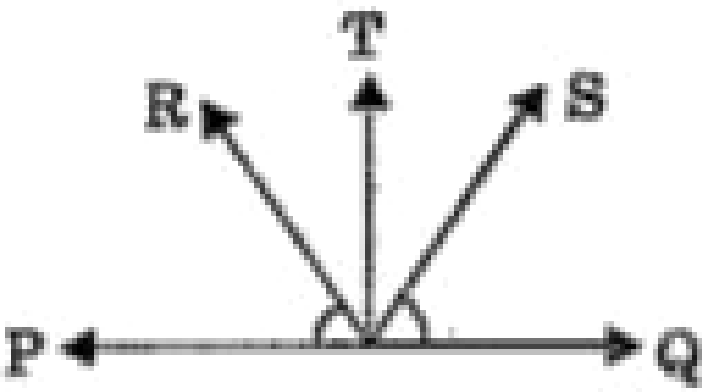


$\angle POR$ is..... of $\angle ROT$



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27. Observe the figure and complete the statement



$\angle QOS$ is of $\angle SOP$



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