NCERT SOLUTIONS

CLASS - 7th

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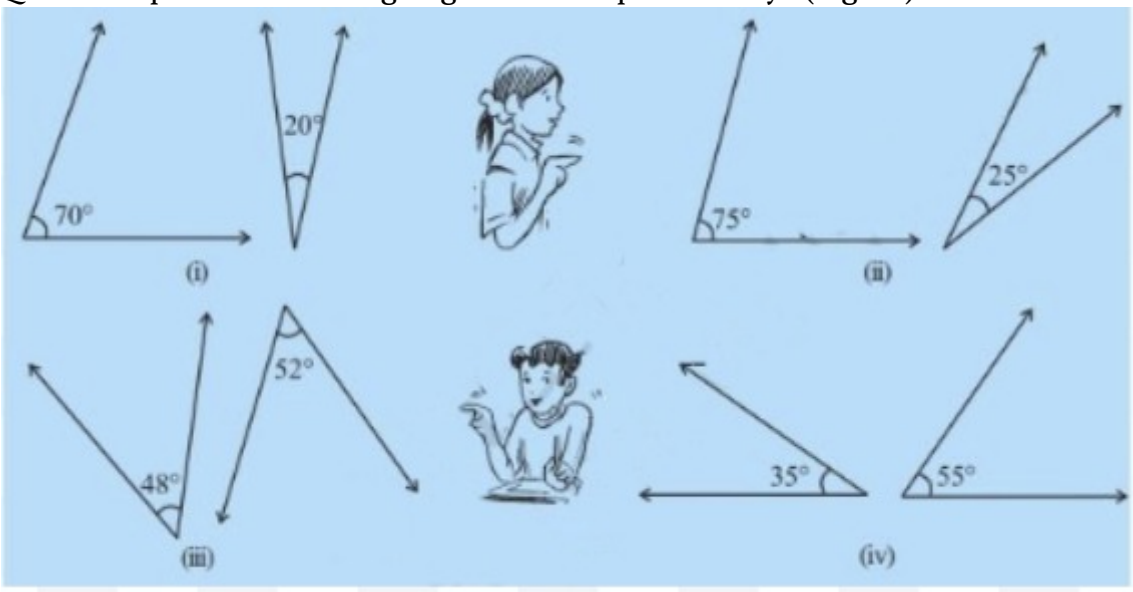
Class : 7th
Subject : Maths
Chapter : 5
Chapter Name : Lines and Angles

Exercise 5.1

Q1 Which pairs of following angles are complementary? (Figure)



Answer. Missing

Page : 95 , Block Name : Try These

Q2 What is the measure of the complement of each of the following angles?
(i) 45°
(ii) 65°
(iii) 41°
(iv) 54°

Answer. Missing

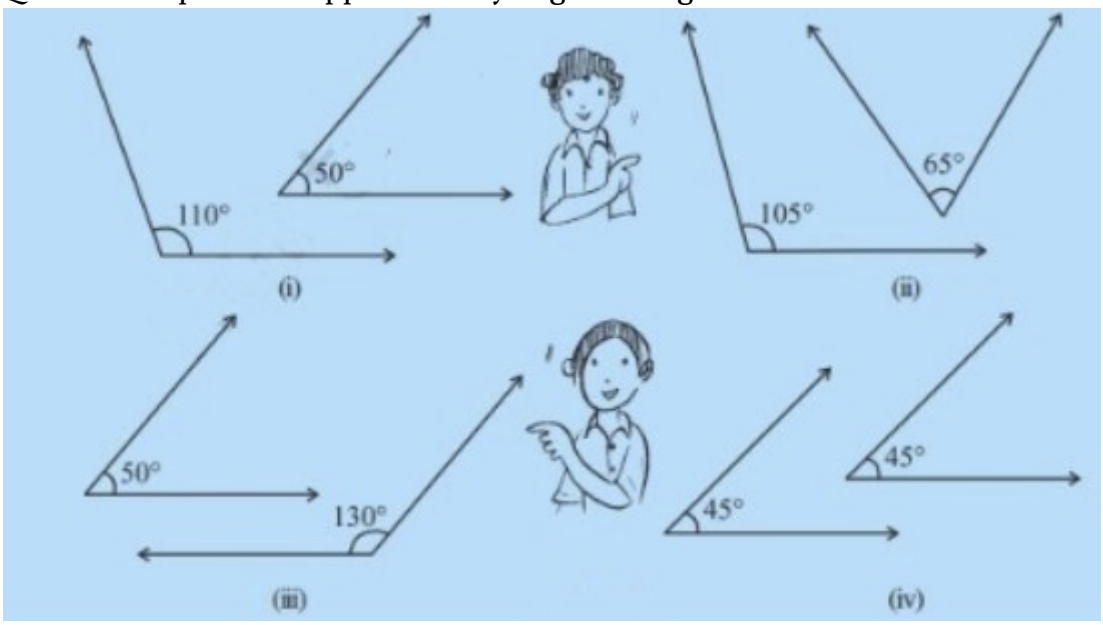
Page : 95 , Block Name : Try These

Q3 The difference in the measures of two complementary angles is 12o . Find the measures of the angles.

Answer. Missing

Page : 95 , Block Name : Try These

Q1 Find the pairs of supplementary angles in Figure:



Answer. Missing

Page : 96 , Block Name : Try These

Q2 What will be the measure of the supplement of each one of the following angles?
(i) 100°
(ii) 90°
(iii) 55°
(iv) 125°

Answer. Missing

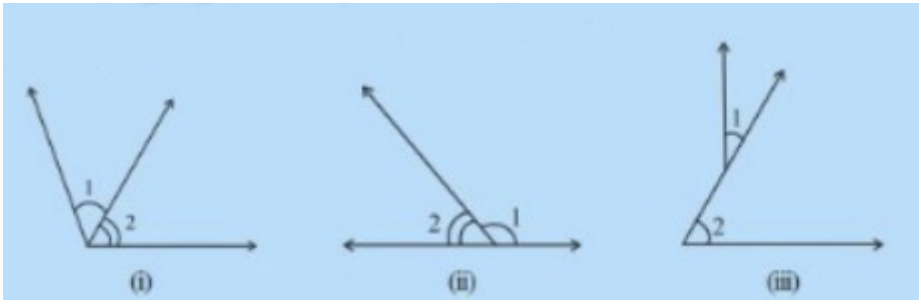
Page : 97 , Block Name : Try These

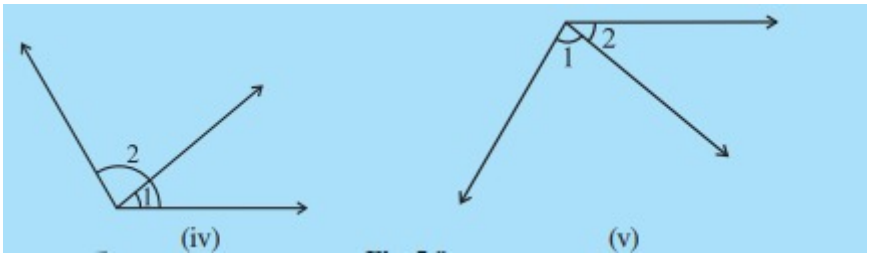
Q3 Among two supplementary angles the measure of the larger angle is 44o more than the measure of the smaller. Find their measures.

Answer. Missing

Page : 97 , Block Name : Try These

Q1 Are the angles marked 1 and 2 adjacent? (Figure). If they are not adjacent, say, ‘why’.

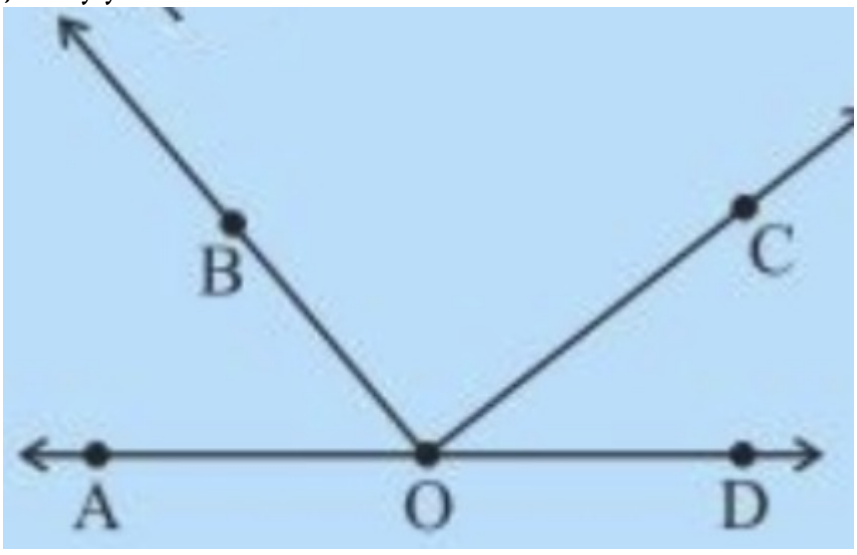




Answer. Missing

Page : 97 , Block Name : Try These

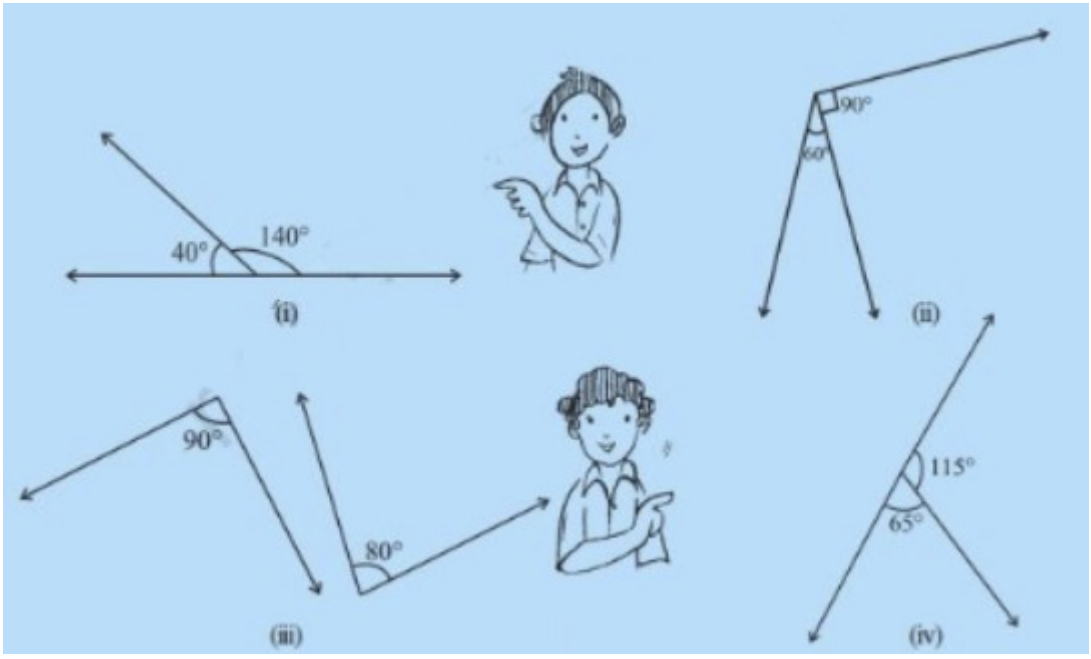
Q2 In the given Figure, are the following adjacent angles?
(a) ∠AOB and ∠BOC
(b) ∠BOD and ∠BOC
Justify your answer.



Answer. Missing

Page : 98 , Block Name : Try These

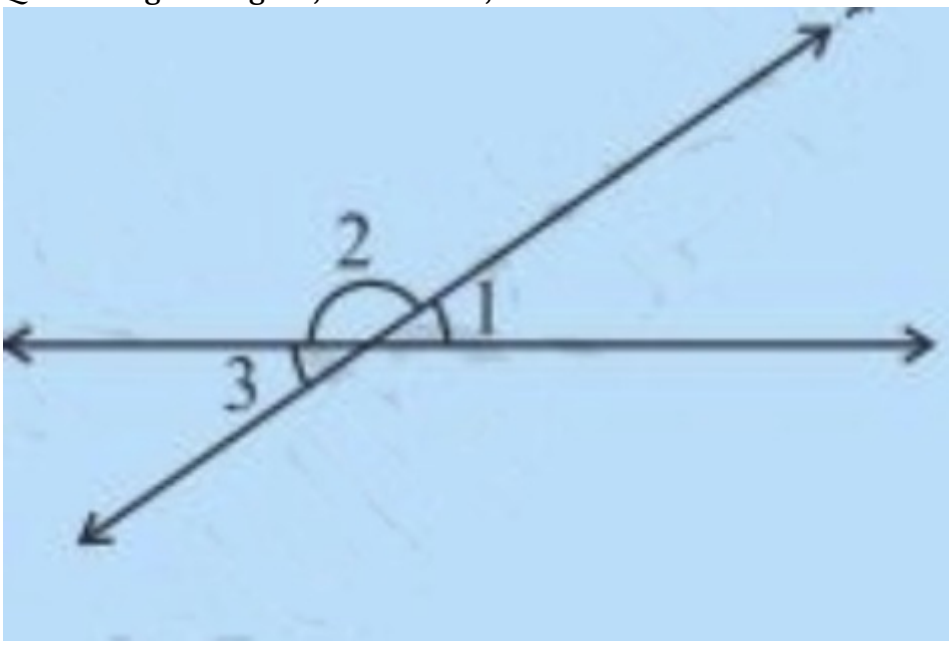
Q1 Check which of the following pairs of angles form a linear pair (Figure):



Answer. Missing

Page : 99 , Block Name : Try These

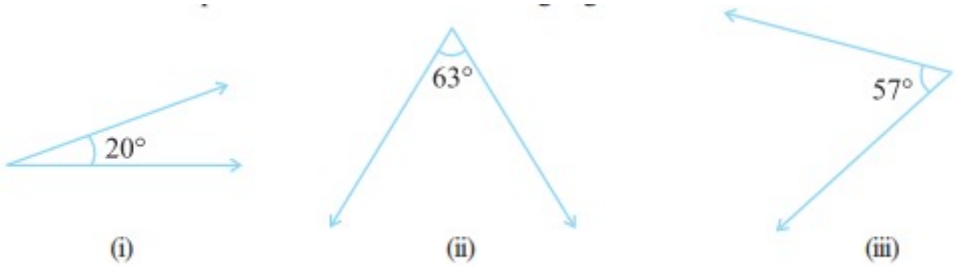
Q1 In the given figure, if ∠1 = 30º, find ∠2 and ∠3.



Answer. Missing

Page : 101 , Block Name : Try These

Q1 Find the complement of each of the following angles:



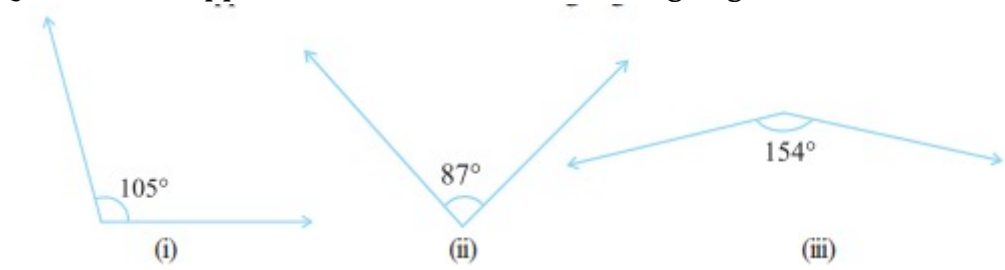
Answer. The sum of the measures of complementary angles is 90°.
(i) 20°
Complement = $90^\circ - 20^\circ$
= 70°

(ii) 63°
Complement = $90^\circ - 63^\circ$
$= 27^\circ$

(iii) 57°
Complement = $90^\circ - 57^\circ$
= 33°

Page : 101 , Block Name : Exercise 5.1

Q2 Find the supplement of each of the following angles:



Answer. The sum of the measures of supplementary angles is 180°
(i) 105°
Supplement = $180^\circ - 105^\circ$
$= 75^\circ$

(ii) 87°
Supplement = $180^\circ - 87^\circ$
$= 93^\circ$

(iii) 154°
Supplement = $180^\circ - 154^\circ$
$= 26^\circ$

Page : 102 , Block Name : Exercise 5.1

Q3 Identify which of the following pairs of angles are complementary and which are

supplementary.
(i) 65º, 115º
(ii) 63º, 27º
(iii) 112º, 68º
(iv) 130º, 50º
(v) 45º, 45º
(vi) 80º, 10º

Answer. The sum of the measures of complementary angles is 900 and that of supplementary angles is 180°
(i) $65^\circ, 115^\circ$
Sum of the measures of these angles = $65^\circ + 115^\circ = 180^\circ$
∴These angles are supplementary angles.

(ii) $112^\circ, 68^\circ$
Sum of the measures of these angles = $63^\circ + 27^\circ = 90^\circ$
∴ These angles are complementary angles.

(iii) $112^\circ, 68^\circ$
Sum of the measures of these angles = $112^\circ + 68^\circ = 180^\circ$
∴ These angles are supplementary angles.

(iv) $130^\circ, 50^\circ$
Sum of the measures of these angles = $130^\circ + 50^\circ = 180^\circ$
∴ These angles are supplementary angles.

(v) $45^\circ, 45^\circ$
Sum of the measures of these angles = $45^\circ + 45^\circ = 90^\circ$
∴ These angles are complementary angles.

(vi) $80^\circ, 10^\circ$
Sum of the measures of these angles = $80^\circ + 10^\circ = 90^\circ$
∴ These angles are complementary angles.

Page : 102 , Block Name : Exercise 5.1

Q4 Find the angle which is equal to its complement.

Answer. Let the angle be x.
Complement of this angle is also x.
The sum of the measures of a complementary angle pair is 90°
$\therefore x + x = 90^\circ$
$2x = 90^\circ$
$x = \frac{90^\circ}{2} = 45^\circ$

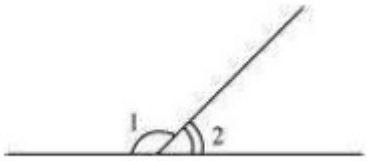
Page : 102 , Block Name : Exercise 5.1

Q5 Find the angle which is equal to its supplement.

Answer. Let the angle be x.
Supplement of this angle is also x.
The sum of the measures of a supplementary angle pair is 80°
$\therefore x + x = 180^\circ$
$2x = 180^\circ$
$\mathrm{x} = 90^\circ$

Page : 102 , Block Name : Exercise 5.1

Q6 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.



Answer. $\angle 1$ and $\angle 2$ are supplementary angles.
If $\angle 1$ is reduced, then $\angle 2$ should be increased by the same measure so that this angle pair remains supplementary.

Page : 102 , Block Name : Exercise 5.1

Q7 Can two angles be supplementary if both of them are:
(i) acute?
(ii) obtuse?
(iii) right?

Answer. (i) No. Acute angle is always lesser than 90°. It can be observed that two angles, even of 89°, cannot add up to 180°. Therefore, two acute angles cannot be in a supplementary angle pair.

(ii) No. Obtuse angle is always greater than 90°. It can be observed that two angles, even of 91°, will always add up to more than 180°. Therefore, two obtuse angles cannot be in a supplementary angle pair.

(iii) Yes. Right angles are of 90° and $90^\circ + 90^\circ = 180^\circ$
Therefore, two right angles from a supplementary angle pair together.

Page : 102 , Block Name : Exercise 5.1

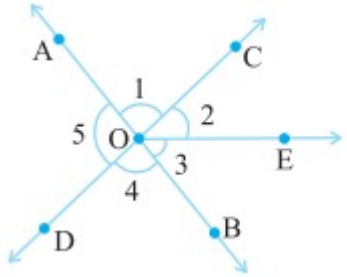
Q8 An angle is greater than 45°. Is its complementary angle greater than 45° or equal to 45° or less than 45°?

Answer. LetA and B are two angles making a complementary angle pair and A is greater than 45°.

$A + B = 90^\circ$
$B = 90^\circ - A$
Therefore, B will be lesser than 45°.

Page : 102 , Block Name : Exercise 5.1

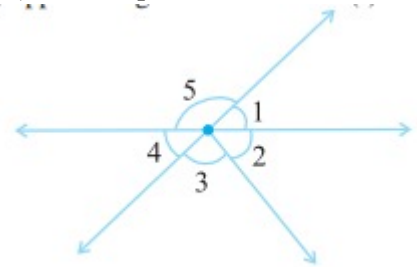
Q9 In the adjoining figure:
(i) Is ∠1 adjacent to ∠2?
(ii) Is ∠AOC adjacent to ∠AOE?
(iii) Do ∠COE and ∠EOD form a linear pair?
(iv) Are ∠BOD and ∠DOA supplementary?
(v) Is ∠1 vertically opposite to ∠4?
(vi) What is the vertically opposite angle of ∠5?



Answer. (i) Yes. Since they have a common vertex O and also a common arm OC. Also, their non-common arms, OA and OE, are on either side of the common arm.
(ii) No. They have a common vertex O and also a common arm OA. However, their non-common arms, OC and OE, are on the same side of the common arm. Therefore, these are not adjacent to each other.
(iii) Yes. Since they have a common vertex O and a common arm OE. Also, their non- common arms, OC and OD, are opposite rays.
(iv) Yes. Since ∠BOD and ∠DOA have a common vertex O and their non-common arms are opposite to each other.
(v) Yes. Since these are formed due to the intersection of two straight lines (AB and CD).
(vi) ∠COB is the vertically opposite angle of ∠5 as these are formed due to the intersection of two straight lines, AB and CD.

Page : 102 , Block Name : Exercise 5.1

Q10 Indicate which pairs of angles are:
(i) Vertically opposite angles.
(ii) Linear pairs.

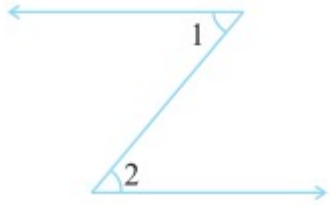


Answer. (i) ∠1 and ∠4, ∠5 and ∠2+∠3 are vertically opposite angles as these are formed due to

the intersection of two straight lines.
(ii) ∠1 and ∠5,∠5 and ∠4 as these have a common vertex and also have non-common arms opposite to each other.

Page : 102 , Block Name : Exercise 5.1

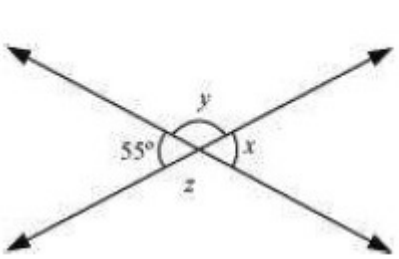
Q11 In the following figure, is ∠1 adjacent to ∠2? Give reasons.



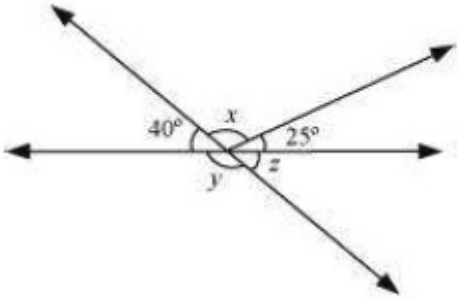
Answer. ∠1 and ∠2 are not adjacent angles because their vertex is not common.

Page : 103 , Block Name : Exercise 5.1

Q12 Find the values of the angles x, y, and z in each of the following:



(i)



(ii)

Answer. (i) Since ∠x and $\angle 55^{\circ}$ are vertically opposite angles,
$\angle x = 55^{\circ}$
$\angle x + \angle y = 180^{\circ}$ (Linear pair)
$55^{\circ} + Ly = 180^{\circ}$
$\angle y = 180^{\circ} - 55^{\circ} = 125^{\circ}$
$\angle \mathrm{y} = \angle \mathrm{z}$ (Vertically opposite angles)
$\angle z = 125^{\circ}$
(ii) $\angle \mathrm{Z} = 40^{\circ}$ (Vertically opposite angles)
$\angle y + \angle z = 180^{\circ}$ (Linear pair)
$\angle y = 180^{\circ} - 40^{\circ} = 140^{\circ}$
$40^{\circ} + \angle x + 25^{\circ} = 180^{\circ}$ (Angles on a straight line)
$65^{\circ} + \angle x = 180^{\circ}$
$\angle x = 180^{\circ} - 65^{\circ} = 115^{\circ}$

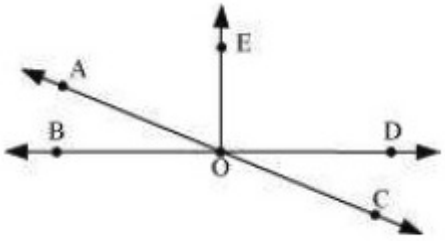
Page : 103 , Block Name : Exercise 5.1

Q13 Fill in the blanks:
(i) If two angles are complementary, then the sum of their measures is _____.
(ii) If two angles are supplementary, then the sum of their measures is _____.
(iii) Two angles forming a linear pair are _____.
(iv) If two adjacent angles are supplementary, they form a _____.
(v) If two lines intersect at a point, then the vertically opposite angles are always _____.
(vi) 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 _____.

Answer. (i) 90°
(ii) 180°
(iii) Supplementary
(iv) Linear pair
(v) Equal
(vi) Obtuse angles

Page : 103 , Block Name : Exercise 5.1

Q14 In the adjoining figure, name the following pairs of angles.



(i) Obtuse vertically opposite angles
(ii) Adjacent complementary angles
(iii) Equal supplementary angles
(iv) Unequal supplementary angles
(v) Adjacent angles that do not form a linear pair.

Answer. (i) $\angle AOD, \angle BOC$
(ii) $\angle \mathrm{EOA}, \angle \mathrm{AOB}$
(iii) $\angle \mathrm{EOB}, \angle \mathrm{EOD}$
(iv) $\angle \mathrm{EOA}, \angle \mathrm{EOC}$
(v) $\angle \mathrm{AOB}$ and $\angle \mathrm{AOE}, \angle \mathrm{AOE}$ and $\angle \mathrm{EOD}, \angle \mathrm{EOD}$ and $\angle \mathrm{COD}$

Page : 103 , Block Name : Exercise 5.1

Exercise 5.2

Q1 Find examples from your surroundings where lines intersect at right angles.

Answer. Missing

Page : 104 , Block Name : Try These

Q2 Find the measures of the angles made by the intersecting lines at the vertices of an equilateral triangle.

Answer. Missing

Page : 104 , Block Name : Try These

Q3 Draw any rectangle and find the measures of angles at the four vertices made by the intersecting lines.

Answer. Missing

Page : 104 , Block Name : Try These

Q4 If two lines intersect, do they always intersect at right angles?

Answer. Missing

Page : 104 , Block Name : Try These

Q1 Suppose two lines are given. How many transversals can you draw for these lines?

Answer. Missing

Page : 105 , Block Name : Try These

Q2 If a line is a transversal to three lines, how many points of intersections are there?

Answer. Missing

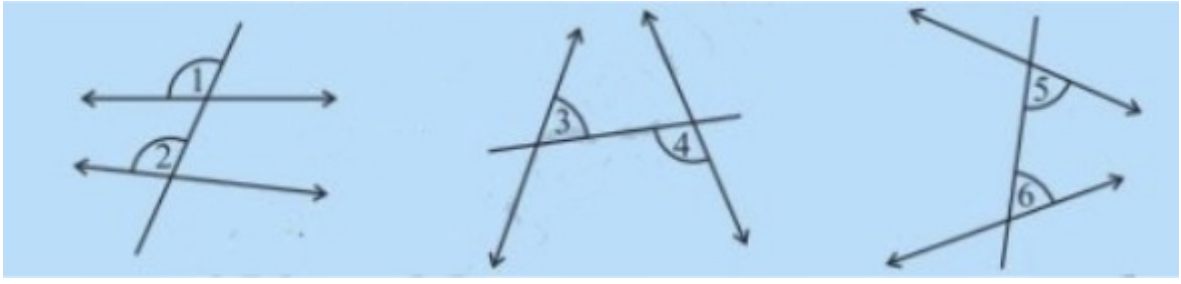
Page : 105 , Block Name : Try These

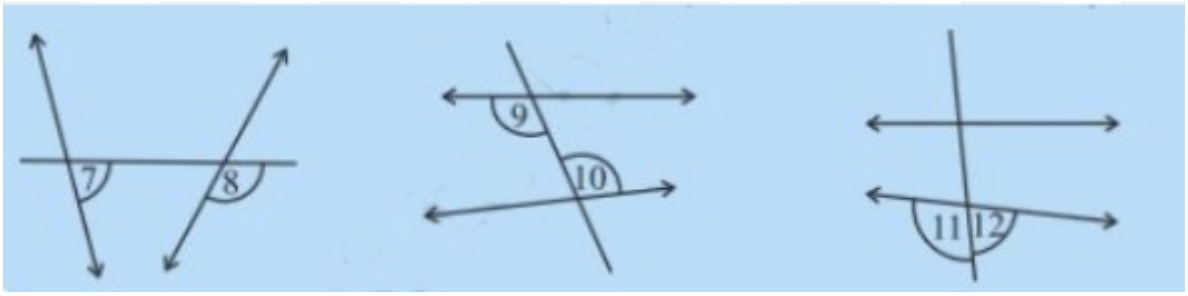
Q3 Try to identify a few transversals in your surroundings.

Answer. Missing

Page : 105 , Block Name : Try These

Q1 Name the pairs of angles in each figure:

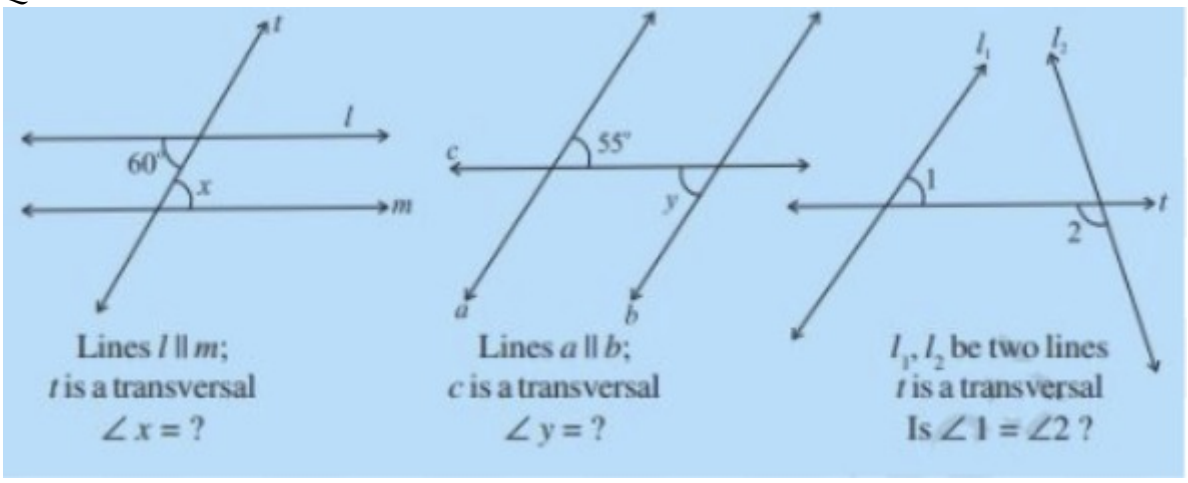


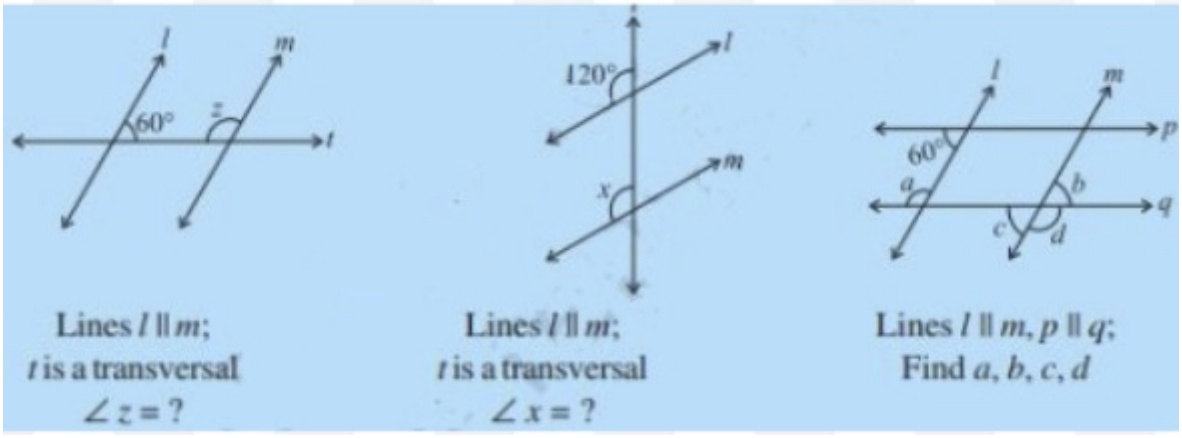


Answer. Missing

Page : 106 , Block Name : Try These

Q1

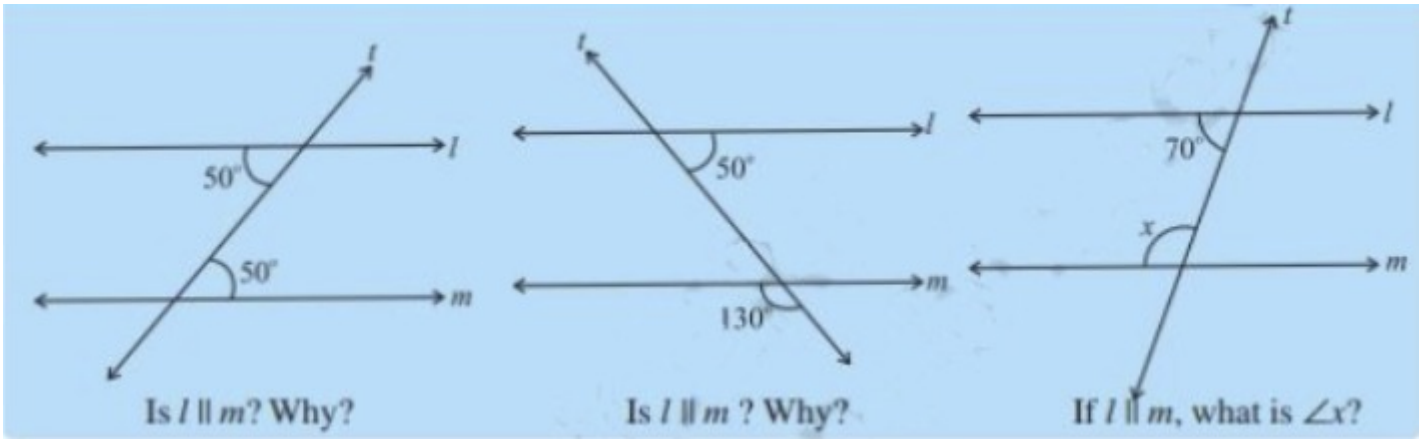




Answer. Missing

Page : 109 , Block Name : Try These

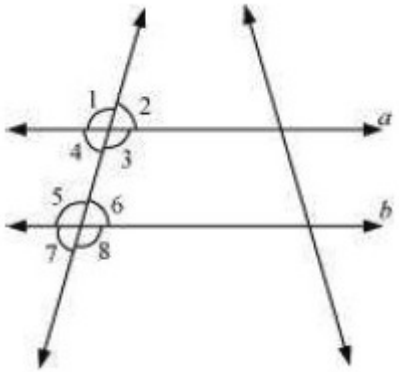
Q1



Answer. Missing

Page : 110 , Block Name : Try These

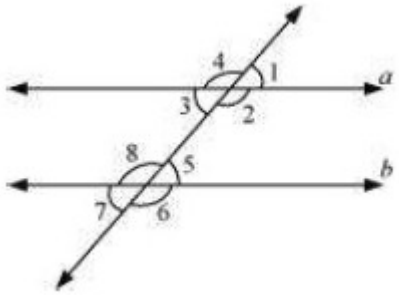
Q1 . State the property that is used in each of the following statements?
(i) If a || b, then ∠1 = ∠5.
(ii) If ∠4 = ∠6, then a || b.
(iii) If ∠4 + ∠5 = 180°, then a || b.



Answer. (i) Corresponding angles property.
(ii) Alternate interior angles property
(iii) Interior angles on the same side of transversal are supplementary.

Page : 110 , Block Name : Exercise 5.2

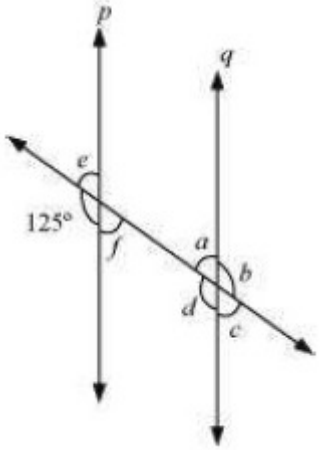
Q2 In the adjoining figure, identify
(i) the pairs of corresponding angles.
(ii) the pairs of alternate interior angles.
(iii) the pairs of interior angles on the same side of the transversal.
(iv) the vertically opposite angles.



Answer. (i) $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$, $\angle 3$ and $\angle 7$, $\angle 4$ and $\angle 8$
(ii) $\angle 2$ and $\angle 8$, $\angle 3$ and $\angle 5$
(iii) $\angle 2$ and $\angle 5$, $\angle 3$ and $\angle 8$
(iv) $\angle 1$ and $\angle 3$, $\angle 2$ and $\angle 4$, $\angle 5$ and $\angle 7$, $\angle 6$ and $\angle 8$

Page : 110 , Block Name : Exercise 5.2

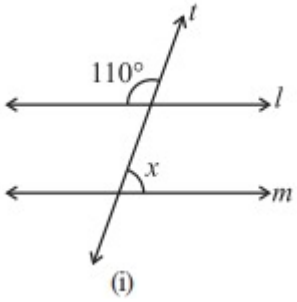
Q3 In the adjoining figure, p || q. Find the unknown angles.

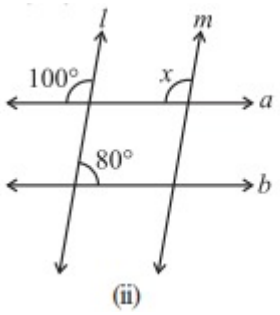


Answer. $\angle \mathrm{d} = 125^{\circ}$(Corresponding angles)
$\angle \mathrm{e} = 180^{\circ} - 125^{\circ} = 55^{\circ}$(Linear pair)
$\angle f = \angle e = 55^{\circ}$ (Vertically opposite angles)
$\angle \mathrm{c} = \angle \mathrm{f} = 55^{\circ}$ (Corresponding angles)
$\angle \mathrm{a} = \angle \mathrm{e} = 55^{\circ}$(Corresponding angles)
$\angle \mathrm{b} = \angle \mathrm{d} = 125^{\circ}$ (Vertically opposite angles)

Page : 110 , Block Name : Exercise 5.2

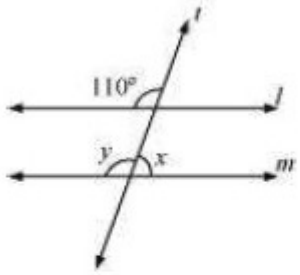
Q4 Find the value of x in each of the following figures if l || m.





Answer.

(i)



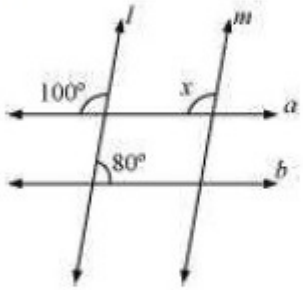
∠y = 110° (Corresponding angles)

∠x + ∠y = 180° (Linear pair)

∠y = 180° − 110°

= 70°

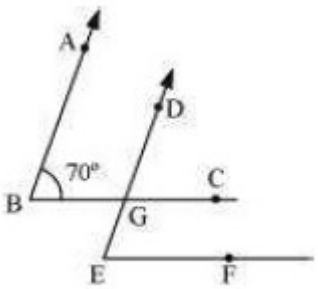
(ii)



∠x = 100° (Corresponding angles)

Page : 111 , Block Name : Exercise 5.2

Q5 In the given figure, the arms of two angles are parallel. If ∠ABC = 70°, then find
(i) ∠DGC
(ii) ∠DEF



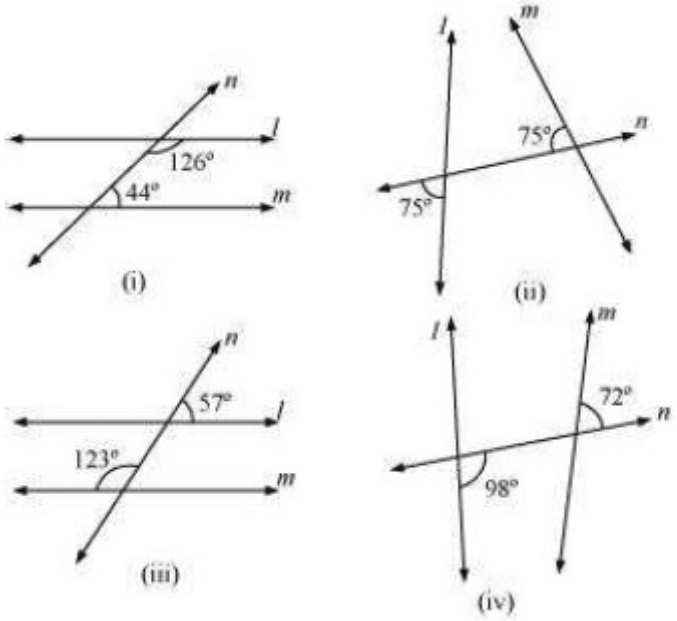
Answer. (i) Consider that ABII DG and a transversal line BC is intersecting them.

$\angle \mathrm{DGC} = \angle \mathrm{ABC}(\text{ Corresponding angles })$
$\angle \mathrm{DGC} = 70^{\circ}$

(ii) Consider that BCII EF and a transversal line DE is intersecting them.
$\angle \mathrm{DEF} = \angle \mathrm{DGC}(\text{ Corresponding angles })$
$\angle \mathrm{DEF} = 70^{\circ}$

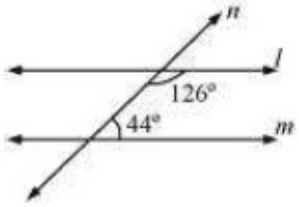
Page : 111 , Block Name : Exercise 5.2

Q6 In the given figures below, decide whether l is parallel to m.



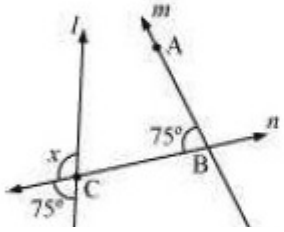
Answer.

(i)



Consider two lines, l and m, and a transversal line n which is intersecting them. Sum of the interior angles on the same side of transversal = 126° + 44° = 170° As the sum of interior angles on the same side of transversal is not 180°, therefore, l is not parallel to m.

(ii)

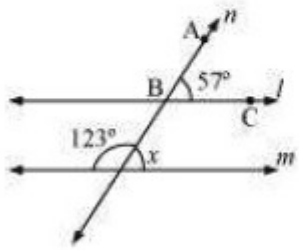


x + 75° = 180° (Linear pair on line l)

x = 180° − 75° = 105°

For l and m to be parallel to each other, corresponding angles (∠ABC and ∠x)should be equal. However, here their measures are 75° and 105° respectively. Hence, these lines are not parallel to each other.

(iii)

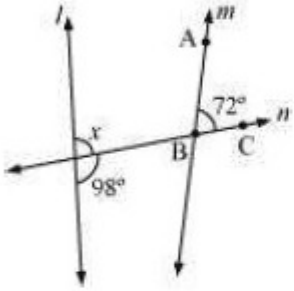


∠x + 123° = 180° (Linear pair)

∠x = 180° − 123° = 57°

For l and m to be parallel to each other, corresponding angles (∠ABC and ∠x)should be equal. Here, their measures are 57° and 57° respectively. Hence, these lines are parallel to each other.

iv.



98 + ∠x = 180° (Linear pair)

∠x = 82°

For l and m to be parallel to each other, corresponding angles (∠ABC and ∠x)should be equal. However, here their measures are 72° and 82° respectively. Hence, these lines are not parallel to each other.