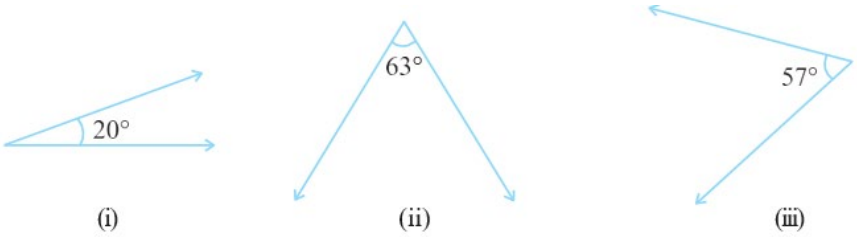
CLASS NOTES-ANSWERS

EXERCISE 5.1

1. Find the complement of each of the following angles:



Answer:

(i) Given angle = 20°

Complement angle of 20° = 90° − 20° = 70°

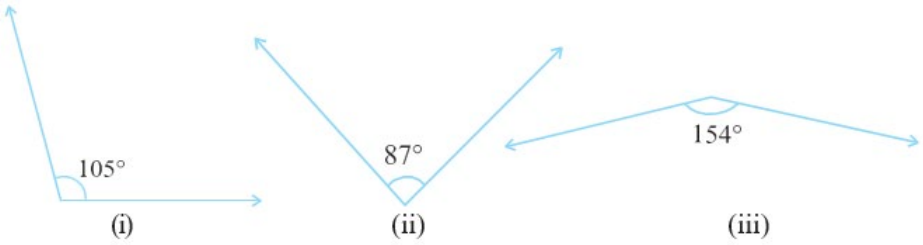
(ii) Given angle = 63°

Complement angle of 63° = 90° − 63° = 27°

(iii) Given angle = 57°

Complement angle of 57° = 90° − 57° = 33°

2. Find the supplement of each of the following angles:



Answer:

(i) Given angle = 105°

Supplement angle of 105° = 180° − 105° = 75°

(*ii*) Given angle = 87°

Supplement angle of 87° = 180° − 87° = 93

(*iii*) Given angle = 154°

Supplement angle of 154°= 180° − 154° = 26°

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

(i) 65°, 115° (ii) 63°, 27° (iii) 112°, 68° (iv) 130°, 50°

(v) 45°, 45° (vi) 80°, 10°

Answer:

(i) 65° + 115° = 180°

Therefore, these two angles are supplementary.

(ii) 63° + 27° = 90°

Therefore, these two angles are complementary.

(iii) 112° + 68° = 180°

Therefore, these two angles are supplementary

(iv) 130° + 50° = 180°

Therefore, these two angles are supplementary

(v) 45° + 45° = 90°

Therefore, these two angles are complementary

(vi) 80° + 10° = 90°

Therefore, these two angles are complementary.

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

Answer: Let the angle be x.

Therefore, complement of this angle will also be x.

The sum of measure of pair of complementary angles is $90°$.

$x + x = 90°$

$2x = 90°$

$x = \frac{90}{2}$

$x = 45°$

Thus, the angle which is equal to its complement is $45°$.

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

Answer: Let the angle be x.

Therefore, supplement of this angle will also be x.

The sum of measure of pair of supplementary angles is $180°$.

$x + x = 180°$

$2x = 180°$

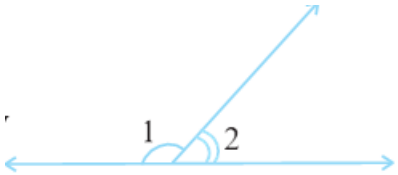
$x = \frac{180}{2}$

$x = 90°$

Thus, the angle which is equal to its supplement is $90°$.

6. In the given figure, $\angle 1$ and $\angle 2$ are supplementaryangles.

If $\angle 1$ is decreased, what changes should take placein $\angle 2$ so that both the angles still remain supplementary.



Answer: If $\angle$ 1 is decreased by some degrees, then $\angle$ 2 will also be increased with the same degree, so both the angles will remain supplementary.

7. Can two angles be supplementary if both of them are:

(i) acute? (ii) obtuse? (iii) right?

Answer:

(i) No, sum of acute angles is less than 180°.

(ii) No, sum of obtuse angles is greater than 180°.

(iii) Yes, sum of two right angles is 180°.

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

Answer:

Let there be two angles $\angle 1$ and $\angle 2$.

Therefore $\angle 1 > 45°$ (given)

Adding $\angle 2$ to both sides ,we get

$\angle 1 + \angle 2 > 45° + \angle 2$

$90° > 45° + \angle 2$

$90° - 45° > \angle 2$

$45° > \angle 2$

Therefore, its complementary angle will be less than 45°.

9. In the adjoining figure:

(i) Is $\angle 1$ adjacent to $\angle 2$?

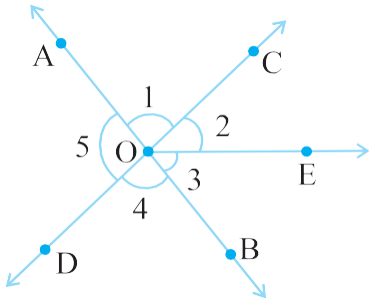
(ii) Is $\angle AOC$ adjacent to $\angle AOE$?

(iii) Do $\angle COE$ and $\angle EOD$ form a linear pair?

(iv) Are $\angle BOD$ and $\angle DOA$ supplementary?

(v) Is $\angle 1$ vertically opposite to $\angle 4$?

(vi) What is the vertically opposite angle of $\angle 5$?



Answer:

(i) Yes, because they have common vertex o and common arm OC.

(ii) No, they have non-common arms on either side of common arms.

(iii) Yes, they form linear pair.

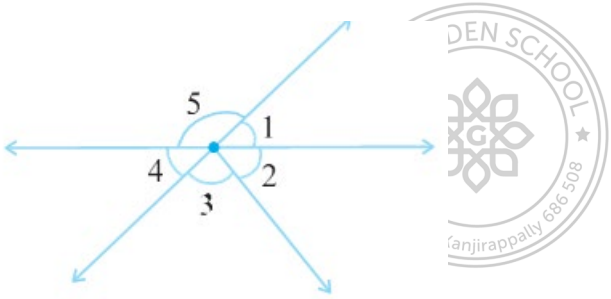
(iv) Yes, they are supplementary.

(v) Yes, they are vertical angles because they are formed due to intersection ofstraight lines.

(vi) Vertically opposite angle of $\angle 5$ is $\angle 2 + \angle 3$ i.e. $\angle$ COB.

10. Indicate which pairs of angles are:

(i) Vertically opposite angles. (ii) Linear pairs.

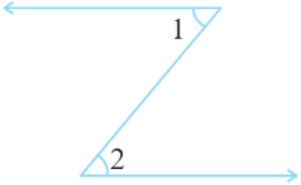


Answer:

(i) $\angle 1$ and $\angle$ 4, $\angle 5$ and $\angle$ 2 + $\angle$ 3 are vertically opposite angles as they formed due to intersection of two straight lines.

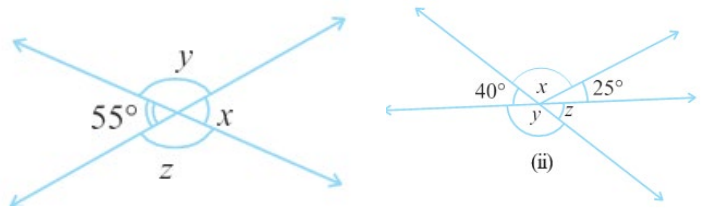
(ii) $\angle$ 1 and $\angle$ 5 , $\angle$ 5 and $\angle$ 4 forms linear pair

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



Answer: $\angle 1$ is not adjacent to $\angle 2$ because their vertex is not common.

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



Answer:

(i) $\angle x = 55°$ (Vertically opposite angle)

$\angle x + \angle y = 180°$ (Linear pair)

$55° + \angle y = 180°$

$\angle y = 180° - 55°$

$\angle y = 125°$

Therefore, $\angle y = \angle z = 125°$ (Vertically opposite angle)

Hence, $\angle x = 55°$, $\angle y = 125°$, $\angle z = 125°$

(ii) By using angle sum property,

$40° + x + 25° = 180°$ (Angles on straight line)

$x + 65° = 180°$

$x = 180° - 65° = 115°$

Also, $40° + y = 180°$ (Linear pair)

$y = 180° - 40°$

$y = 140°$

$y + z = 180°$ (Linear pair)

$140° + z = 180°$ ($y = 140°$)

$z = 180° - 140°$

$z = 40°$

Thus, x = 115°, y = 140° and z = 40°

13. 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____.

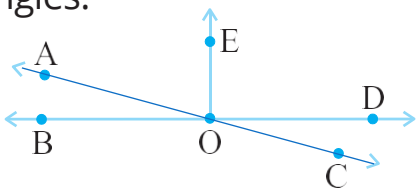
(v) If two lines intersect at a point, then the vertically opposite angles are always _____.

(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 Angle

14. 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) ∠AOD = ∠ BOC

(ii) ∠ EOA and ∠ AOB are adjacent complementary angles.

(iii) ∠ EOB and ∠ EOD

(iv) ∠ EOA and ∠EOC.

(v) ∠ AOB and ∠ AOE; ∠ AOE and ∠ EOD; ∠ EOD and ∠ COD