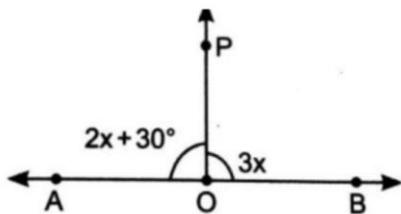


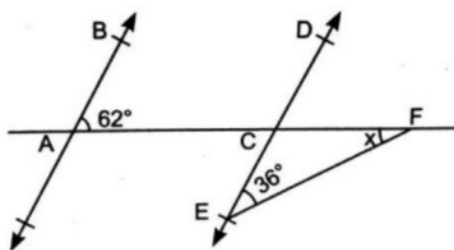
**CBSE Worksheet****Class 9 Maths****Chapter 6 Lines and Angles**

1. If the complement of an angle is equal to the supplement of twice times the angle, then find the measure of the angle.
2. In an  $\triangle ABC$ ,  $\angle A + \angle B = 110^\circ$ ,  $\angle C + \angle A = 135^\circ$ . Find  $\angle A$ .
3. In the given figure,  $AOB$  is a line for what value of  $x$ ?



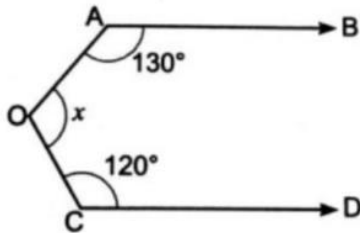
*Image: An image of two lines AB and PO intersecting at o*

4. In the given figure,  $AB \parallel ED$ , find  $x$ .



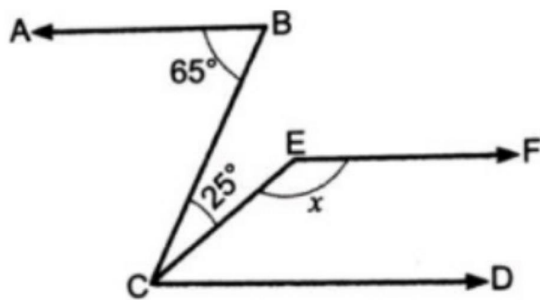
*Image: An image of two parallel lines ABIED*

**5. Find the value of  $x$  in the given figure if ABIICD**



*Image: An image of two parallel lines ABIICD*

**6. Find the value of  $x$  in the given figure if ABIICDIIEF**



*Image: An image of three parallel lines ABIICDIIEF*

- 7. If  $4 \angle A = 3 \angle B = 12 \angle C$  in a triangle ABC. Find all the angles**
- 8. The angles of a triangle are in the ratio 3:7:8. Find the angles of the triangle.**
- 9. What is the supplementary angle of  $50^\circ$ .**
- 10. Find the value of  $x$  in the figure given below.**

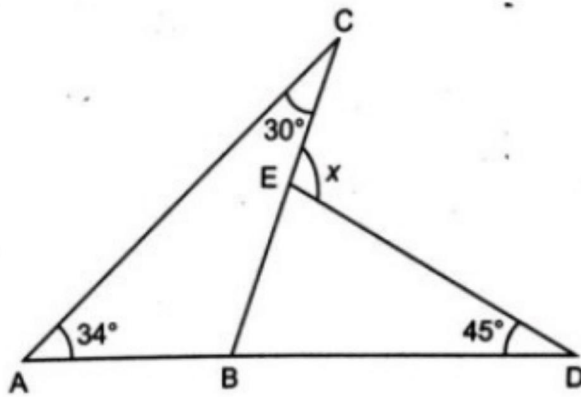


Image: An image of a triangle ABC and BDE

11. If  $AB \parallel CD \parallel EF$  then find the value of  $x$ .

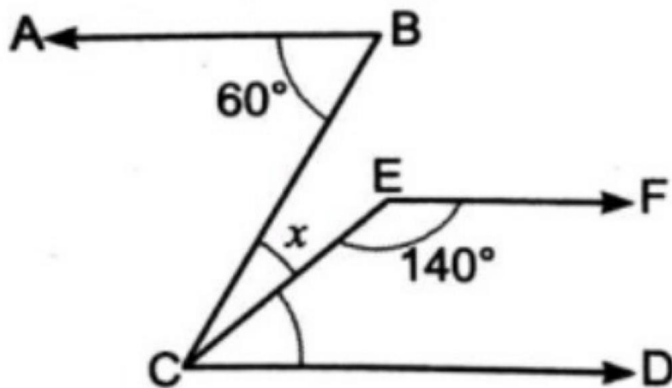
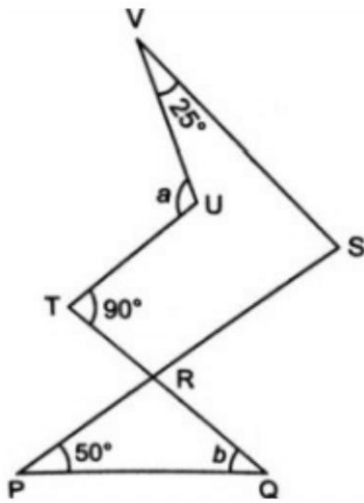


Image: An image of  $AB \parallel CD \parallel EF$

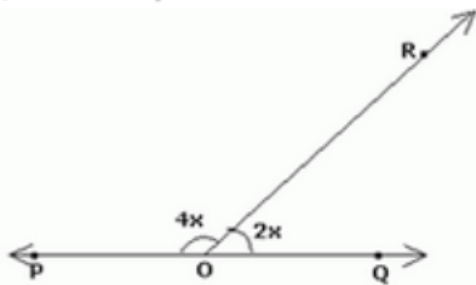
12. In the given figure,  $TU \parallel SR$  and  $TR \parallel SV$ , then find  $\angle a$  and  $\angle b$ .



*Image: An image of a figure made by parallel lines  $TU \parallel SR$  and  $TR \parallel SV$*

**13. What is  $AB^2$  if B is between A and C and  $AC = 10$  cm,  $BC = 5$  cm?**

**14. In the given, figure POQ is a line  $\angle POR = 4x$  and  $\angle QOR = 2x$ . Find the value of x.**

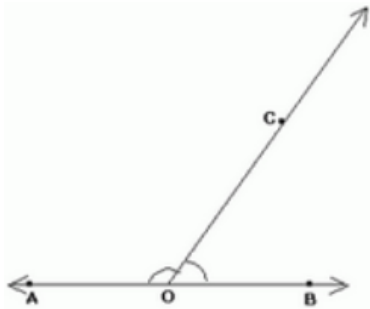


*Image: An image of two lines PQ and OR intersecting at a point o*

**15. In the figure given below, OA and OB are the opposing rays in the figure.**

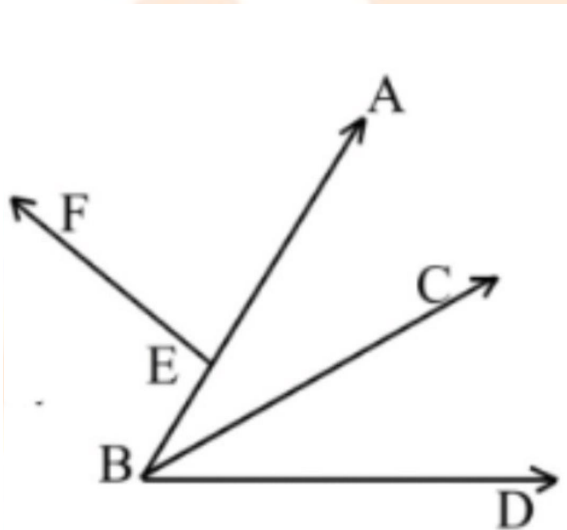
**(i) If  $\angle BOC = 75^\circ$ , Find  $\angle AOC$**

**(ii) If  $\angle AOC = 110^\circ$ , Find  $\angle BOC$ .**



*Image: An image of two lines AB and CO intersecting at a point O.*

**16. Name two pairs of adjacent angles given in the following figure.**



*Image: An image of three lines intersecting at a point B and a line FE lies on AB*

- 17. What is the supplementary angle of  $40^\circ$ ?**
- 18. What is a line segment?**
- 19. What is an angle?**
- 20. What are adjacent angles?**
- 21. What are vertically opposite angles?**
- 22. What are intersecting lines?**
- 23. What are parallel lines?**
- 24. What are alternate interior angles?**
- 25. What are corresponding angles?**

**Answers**

1. Let the required angle is  $x^\circ$

Its complementary angle =  $90^\circ - x$

Its supplementary angle =  $180^\circ - 2x$

$$90^\circ - x = 180^\circ - 2x$$

$$x = 90^\circ$$

2.  $\angle A + \angle B = 110^\circ$ ,  $\angle C + \angle A = 135^\circ$

As we know that in a triangle  $\angle A + \angle B + \angle C = 180^\circ$

By putting the value of  $\angle A + \angle B = 110^\circ$

$$110^\circ + \angle C = 180^\circ$$

$$\angle C = 70^\circ$$

By putting the value of  $\angle C$  in  $\angle C + \angle A = 135^\circ$

$$\angle A = 65^\circ$$

3.  $2x + 30^\circ + 3x = 180^\circ$  ( by linear pair of angle)

$$5x + 30^\circ = 180^\circ$$

$$5x = 150^\circ$$

$$x = 30^\circ$$

4. AB || ED and AC are the transversal

So,  $\angle BAC = \angle DCF = 62^\circ$  ( corresponding angles)

$$\angle DCF + \angle ECF = 180^\circ$$

$$\angle ECF = 180^\circ - 62^\circ$$

$$\angle ECF = 118^\circ$$

$$\angle ECF + \angle CFE + \angle CEF = 180^\circ$$

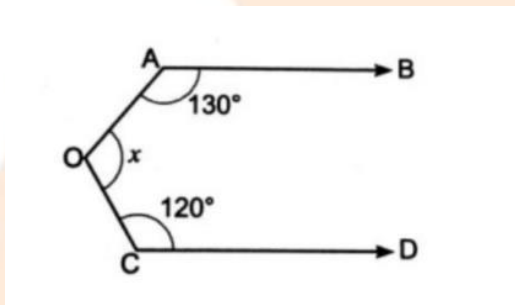
$$118^\circ + \angle CFE + 36^\circ = 180^\circ$$

$$\angle CFE = 180^\circ - 154^\circ$$

$$\angle CFE = 26^\circ$$

Hence, the value of x is  $26^\circ$ .

5. Construction: Draw a line parallel to AB and CD from O and name it OM.



$AB \parallel OM$

$\angle BAO + \angle AOM = 180^\circ$  (The Sum of interior angles on the same side of a transversal is  $180^\circ$ )

$$\angle AOM = 180^\circ - \angle BAO (\angle BAO = 130^\circ)$$

$$\angle AOM = 50^\circ$$

$CD \parallel OM$

$\angle COM + \angle OCD = 180^\circ$  (The Sum of interior angles on the same side of a transversal is  $180^\circ$ )

$$\angle COM + 120^\circ = 180^\circ (\angle OCD = 120^\circ)$$

$$\angle COM = 180^\circ - 120^\circ$$

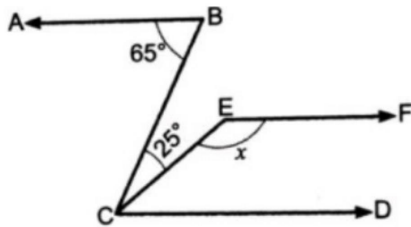
$$\angle COM = 60^\circ$$

$$\angle AOM + \angle COM = x$$

$$x = 60^\circ + 50^\circ$$

$$x = 110^\circ$$

6.  $AB \parallel CD$  and  $CB$  is a transversal



So,  $\angle ABC = \angle BCD$  ( alternate interior angles)

$$\angle ABC = \angle BCE + \angle ECD$$

$$65^\circ = 25^\circ + \angle ECD \quad (\angle BCE = 25^\circ)$$

$$\angle ECD = 40^\circ$$

Now,

$\angle FEC + \angle ECD = 180^\circ$  (The Sum of interior angles on the same side of a transversal is  $180^\circ$ )

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

$$x = 180^\circ - 40^\circ$$

$$x = 140^\circ$$

7. Let  $4 \angle A = 3 \angle B = 12 \angle C = X$

$$\angle A = X/4$$

$$\angle B = X/3$$

$$\angle C = X/12$$

$$\angle A + \angle B + \angle C = 180^\circ$$

$$X/4 + X/3 + X/12 = 180^\circ$$

$$8X/12 = 180^\circ$$



$$2X/3=180^\circ$$

$$X=270^\circ$$

So,  $\angle A = 67.5^\circ$ ,  $\angle B = 90^\circ$ , and  $\angle C = 22.5^\circ$ .

8. Let the measures be  $3x$ ,  $7x$  and  $8x$

$$3x+7x+8x=180^\circ$$

$$18x=180^\circ$$

$$x=10^\circ$$

So, the measures of the angles are  $30^\circ$ ,  $70^\circ$ , and  $80^\circ$ .

9. The sum of supplementary angle is  $180^\circ$

Let  $x$  be one angle and  $50^\circ$  be the other.

$$x + 50^\circ = 180^\circ$$

$$x = 180^\circ - 50^\circ$$

$$x = 130^\circ$$

10.  $\angle CAB + \angle ACB = \angle CBD$  (Sum of two interior angles of a triangle equals the exterior angles of triangle)

$$30^\circ + 34^\circ = \angle CBD$$

$$\angle CBD = 64^\circ$$

In triangle EBD

$$\angle EBD + \angle EDB + \angle BED = 180^\circ$$

$$64^\circ + 45^\circ + \angle BED = 180^\circ$$

$$\angle BED = 71^\circ$$

$$\angle BED + x = 180^\circ \text{ (Linear pair)}$$

$$x = 180^\circ - 71^\circ$$

$$x=109^\circ$$

11.  $EF \parallel CD$  and  $CE$  is transversal

So,  $\angle FEC + \angle ECD = 180^\circ$  (The Sum of interior angles on the same side of a transversal is  $180^\circ$ )

$$\angle ECD = 180^\circ - 140^\circ$$

$$\angle ECD = 40^\circ$$

$AB \parallel CD$  and  $BC$  is a transversal

So,  $\angle ABC = 60^\circ = \angle BCD$

$$\angle ABC = x + \angle ECD$$

$$60^\circ = x + 40^\circ$$

$$x = 20^\circ$$

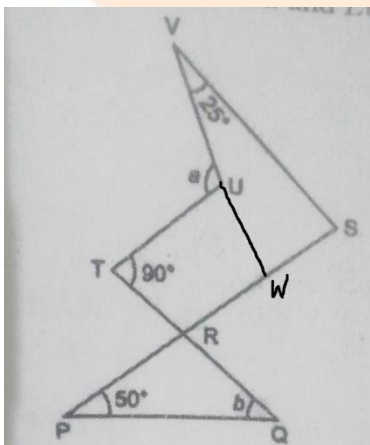
12. By transversal laws,

$$\angle UTR + \angle TRS = 180^\circ \quad (\text{Angles on same side of transversal})$$

$$\angle TRS = 180 - 90 = 90^\circ$$

$$\angle TRS + \angle RSV = 180^\circ \quad (\text{Angles on same side of transversal})$$

$$\angle RSV = 90^\circ$$



$$\angle UWR = 90^\circ + 25^\circ = 115^\circ \quad (\text{Exterior angle property})$$

$$a = \angle UWR = 115^\circ \quad (\text{Corresponding angles})$$

$$\angle PRQ = \angle TRS = 90^\circ \quad (\text{Vertically opposite angles})$$

$$b = 180^\circ - 50^\circ - 90^\circ = 40^\circ \quad (\text{Angle sum property})$$

Thus,  $a = 115^\circ$  and  $b = 40^\circ$

13. Let  $AC = 10\text{cm}$

It is given that B lies between A and C

$$AC = 10\text{cm}$$

$$AB + BC = 10\text{cm}$$

$$AB + 5\text{cm} = 10\text{cm}$$

$$AB = 5\text{cm}$$

$$AB^2 = 25\text{ cm}^2$$

14.  $\angle POR + \angle QOR = 180^\circ$  (By linear pair)

$$4x + 2x = 180^\circ$$

$$6x = 180^\circ$$

$$x = 30^\circ$$

15.

(i)  $\angle AOC + \angle BOC = 180^\circ$  (By linear pair)

When  $\angle BOC = 75^\circ$

$$\angle AOC = 105^\circ$$

(ii) When  $\angle AOC = 110^\circ$

$$\angle AOC + \angle BOC = 180^\circ \text{ (By linear pair)}$$

$$\angle BOC = 70^\circ$$

16.  $\angle FEA$  and  $\angle BEF$  are two pairs of adjacent angles on the side FE.  
 $\angle ABC$  and  $\angle CBD$  are two pairs of adjacent angles on the sides BC.

17. The sum of supplementary angle is  $180^\circ$

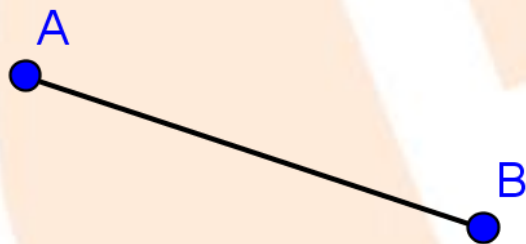
Let  $x$  be one angle and  $40^\circ$  be the other.

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

$$x = 180^\circ - 40^\circ$$

$$x = 140^\circ$$

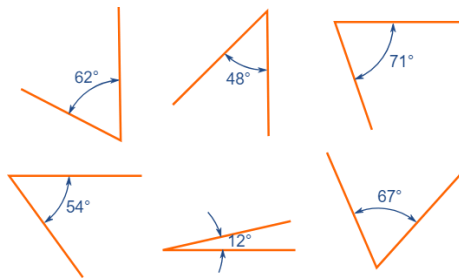
18. A line segment is defined by two different places on the line. A section of a line that connects two locations is another way to define a line segment. In contrast to a line, which has no endpoints and can extend in both directions forever, a line segment has two defined or distinct endpoints.



*Image: An image of a line segment*

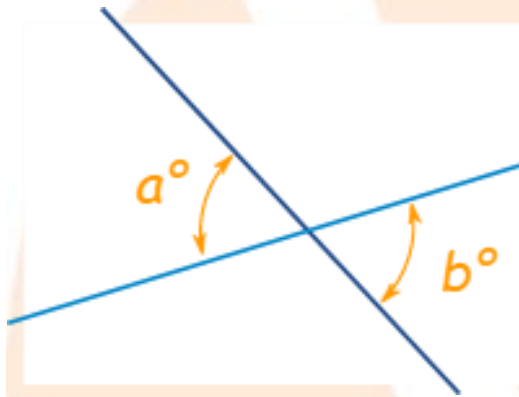
19. An angle is a figure created by two rays that share a terminus and are referred to as the angle's sides and vertices, respectively.

20. Angles that do not overlap but share a common vertex and arm (side) are said to be adjacent angles. Adjacent angles are ones that are consistently positioned next to one another and are generated when two rays intersect at a shared terminal.



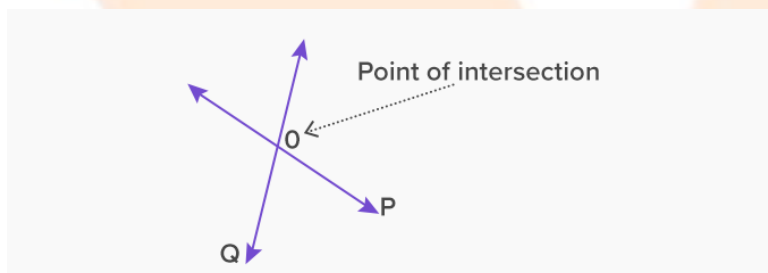
*Image: An image of measurement of different angles*

21. Vertical angles, also referred to as vertically opposite angles, are formed when two lines intersect. A pair of angles that are vertically opposed to one another are always equal.



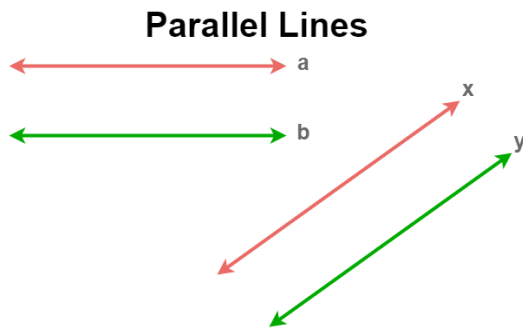
*Image: An image of vertically opposite angles*

22. Intersecting lines are two or more lines that have exactly one point in common. The point of intersection is this central location that connects all of these lines. It should be observed that the intersecting lines only come together at one location, regardless of the angle at which they do so.



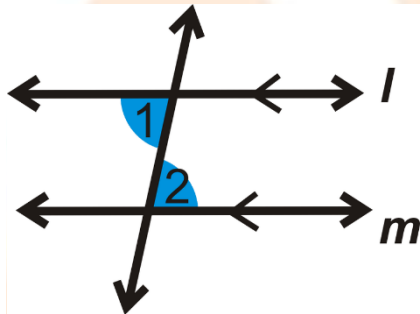
*Image: An image of two intersecting lines*

23. Parallel lines are coplanar straight lines that don't intersect at any point. In the same three-dimensional space, parallel planes are any planes that never cross. Curves with a predetermined minimum distance between them and no contact or intersection are said to be parallel.



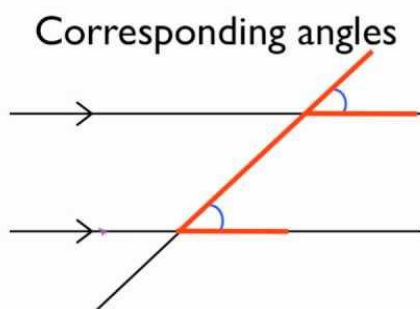
*Image: An image of parallel lines*

24. When a transversal intersects two parallel lines, the angles that are created inside are equal to the alternate pairings of that transversal. Alternate interior angles are what they are termed.



$\angle 1$  and  $\angle 2$  are alternate interior angles.

25. Corresponding angles are those that are created when two parallel lines are intersected by another line, whether it be a transversal or a matching corner



*Image: An images of Corresponding angles*