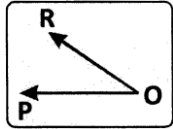
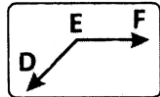


## Lines and Angles

## Multiple Choice Question

1. Which of the following are the units of an angle?  
 (a) Seconds (b) Kilograms  
 (c) Degrees (d) Kilometres
2. What do we call an angle which exactly measures  $90^\circ$ ?  
 (a) An obtuse angle (b) An acute angle  
 (c) A right angle (d) A reflex angle
3. What do we call an angle whose measurement is exactly equal to  $0^\circ$ ?  
 (a) An obtuse angle (b) A straight angle  
 (c) A zero angle (d) A right angle
4. What is an angle which measures exactly  $180^\circ$  called?  
 (a) A zero angle (b) A right angle  
 (c) A straight angle (d) An acute angle
5. Which instrument is used to measure or construct angles?  
 (a) Compasses (b) Scale  
 (c) Protractor (d) Set squares
6. How many rays can be drawn from a given point?  
 (a) 2 (b) 5  
 (c) 8 (d) Infinitely many
7. What do we call a  $169^\circ$  angle?  
 (a) An obtuse angle (b) An acute angle  
 (c) A right angle (d) A zero angle
8. What happens to the measurement of an angle after the extension of its arms?  
 (a) Doubles (b) Triples  
 (c) Remains the same (d) Cannot be said
9. In  $\angle ROP$ , what is the vertex?  

 (a) R (b) P  
 (c) O (d) PR
10. What are the two arms of  $\angle DEF$ ?  

 (a)  $\overrightarrow{ED}$  and  $\overrightarrow{EF}$  (b)  $\overrightarrow{DE}$  and  $\overrightarrow{EF}$   
 (c)  $\overrightarrow{FE}$  and  $\overrightarrow{FD}$  (d)  $\overrightarrow{DE}$  and  $\overrightarrow{FD}$

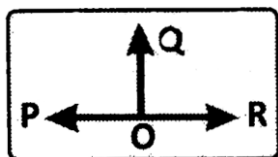
**11.** When two line segments meet at a point forming right angles, what type of segments are they called?

- (a) Parallel segments
- (b) Perpendicular segments
- (c) Equal segments
- (d) Bisecting segments

**12.** How is " $\overline{AB}$  is perpendicular to  $\overline{CD}$ " written symbolically?

- (a)  $\overline{AB} \perp \overline{CD}$
- (b)  $\overline{AB} \parallel \overline{CD}$
- (c)  $\overline{AB} \neq \overline{CD}$
- (d)  $\overline{AB} = \overline{CD}$

**13.**  $\overline{OQ} \perp \overline{PR}$  What is the measure of  $\angle QOR$ ?



- (a)  $180^\circ$
- (b)  $45^\circ$
- (c)  $90^\circ$
- (d)  $120^\circ$

**14.** A line AB is parallel to the line CD. How is this symbolically written?

- (a)  $\overline{AB} \neq \overline{CD}$
- (b)  $\overline{AB} = \overline{CD}$
- (c)  $\overline{AB} \perp \overline{CD}$
- (d)  $\overline{AB} \parallel \overline{CD}$

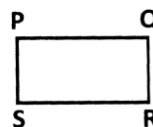
**15.** What are the lines which lie on the same plane and do not intersect at any point called?

- (a) Perpendicular lines
- (b) Intersecting lines
- (c) Parallel lines
- (d) Collinear lines

**16.** When two lines are parallel, what is the distance between them?

- (a) Remains equal.
- (b) Does not remain equal.
- (c) Increases on the right.
- (d) Decreases on the right.

**17.** What is the number of pairs of parallel lines in the given figure?



- (a) 2
- (b) 1
- (c) 4
- (d) 3

**18.** What is the complementary angle of  $20^\circ$ ?

- (a)  $70^\circ$
- (b)  $180^\circ$
- (c)  $90^\circ$
- (d)  $150^\circ$

**19.** What is the supplementary angle of  $120^\circ$ ?

- (a)  $20^\circ$
- (b)  $90^\circ$
- (c)  $60^\circ$
- (d)  $180^\circ$

**20.** What is the measure of a complementary angle of an angle greater than  $45^\circ$ ?

- (a) Less than  $45^\circ$       (b) Equal to  $45^\circ$   
 (c) Greater than  $45^\circ$       (d) Equal to  $90^\circ$

**21.** Which of the following is true?

- (a) Two acute angles are supplementary.  
 (b) Two obtuse angles are supplementary.  
 (c) Two right angles are supplementary.  
 (d) Two reflex angles are supplementary.

**22.** Find the angle which is a complement of itself.

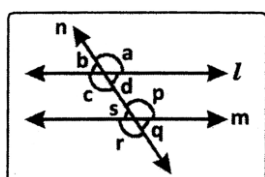
- (a)  $30^\circ$       (b)  $45^\circ$   
 (c)  $90^\circ$       (d)  $180^\circ$

**23.** Which of the following angles is a supplement of itself?

- (a)  $90^\circ$       (b)  $180^\circ$   
 (c)  $45^\circ$       (d)  $110^\circ$

(24 - 30): Observe the given figure in which  $l \parallel m$  and  $n$  is the transversal and answer the questions that follow.

**24.** What type of angles are 'a' and 'p'?



- (a) Corresponding angles

- (b) Alternate angles  
 (c) Vertically opposite angles  
 (d) Interior angle on the same side of the transversal

**25.** What type of angles are 'c' and 'p'?

- (a) Corresponding angles  
 (b) Alternate angles  
 (c) Vertically opposite angles  
 (d) Interior angles on the same side of the transversal

**26.** Which of the following is a pair of corresponding angles?

- (a) d and c      (b) s and r  
 (c) c and r      (d) p and q

**27.** Which of the following is a pair of vertically opposite angles?

- (a) a and b      (b) a and p  
 (c) s and r      (d) p and r

**28.** If the measure of 'c' is  $110^\circ$  what is the measure of 's'?

- (a)  $45^\circ$       (b)  $110^\circ$   
 (c)  $70^\circ$       (d)  $180^\circ$

29. If the measure of  $b = 70^\circ$ , what is the measure of  $s$ ?

- (a)  $110^\circ$  (b)  $70^\circ$   
(c)  $90^\circ$  (d)  $180^\circ$

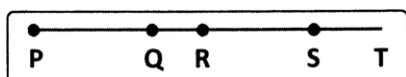
30. If  $b = 70^\circ$ , what is the measure of  $b + p$ ?

- (a)  $180^\circ$  (b)  $110^\circ$   
(c)  $90^\circ$  (d)  $70^\circ$

31. The angle between the two blades of a scissors is  $194^\circ$ . What type of an angle is it?

- (a) straight angle (b) reflex angle  
(c) obtuse angle (d) complete angle

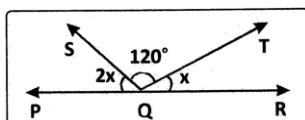
32. Observe the figure given,



Which of the following is true if  $PQ = RS$ ?

- (a)  $PQ + QR = RS$  (b)  $PR = QS$   
(c)  $PQ + QS = RS$  (d)  $PQ - RS = QR$

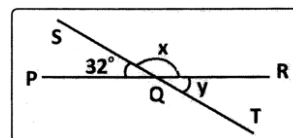
33. PQR is a straight line.



What is the value of  $x$ ?

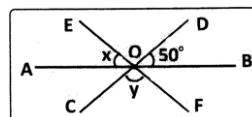
- (a)  $20^\circ$  (b)  $25^\circ$   
(c)  $15^\circ$  (d)  $30^\circ$

34. In the given figure, what is the measure of  $x$ ?



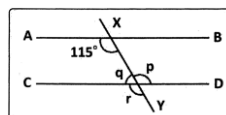
- (a)  $32^\circ$  (b)  $148^\circ$   
(c)  $64^\circ$  (d)  $180^\circ$

35. In the figure,  $\overline{AB}$ ,  $\overline{CD}$  and  $\overline{EF}$  are three straight lines that intersect at O. If  $y$  is thrice  $x$ , find the value of  $y$ .



- (a)  $97.5^\circ$  (b)  $35^\circ$   
(c)  $32.5^\circ$  (d)  $98^\circ$

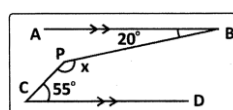
36. In the figure,  $AB \parallel CD$  and  $XY$  is the transversal.



Which of the following is incorrect?

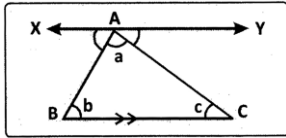
- (a)  $p = 115^\circ$  (b)  $q = 115^\circ$   
(c)  $q = 65^\circ$  (d)  $r = 115^\circ$

37. Find the angle  $x$  in the given figure, if  $AB \parallel CD$



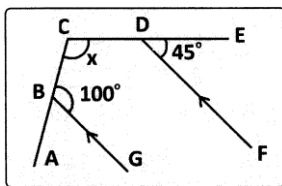
- (a)  $75^\circ$  (b)  $55^\circ$   
(c)  $160^\circ$  (d)  $145^\circ$

38. Through the vertex A of  $\triangle ABC$ , a line XY is drawn parallel to BC.



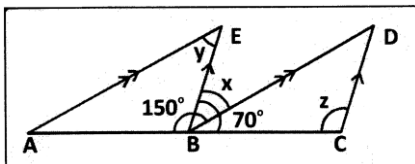
Which of the following is correct?

- (a)  $b = y$   
 (b)  $c = x$   
 (c)  $a = b$   
 (d)  $a + b + c = x + a + y$
39. Find the unknown angle  $x$  in the figure.



- (a)  $45^\circ$  (b)  $125^\circ$   
 (c)  $90^\circ$  (d)  $80^\circ$

40. Observe the figure given.



Compute the sum of  $x$ ,  $y$  and  $z$ .

- (a)  $180^\circ$  (b)  $70^\circ$   
 (c)  $190^\circ$  (d)  $80^\circ$

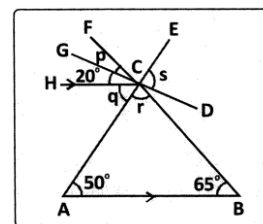
41. If the angles  $(2a - 10)^\circ$  and  $(a - 11)^\circ$  are complementary, what is the value of 'a'?

- (a)  $37^\circ$  (b)  $27^\circ$   
 (c)  $17^\circ$  (d)  $7^\circ$

42. If  $\overrightarrow{OP}$  is a ray standing on a line  $\overrightarrow{OR}$  such that  $\angle POQ = \angle POR$ , what is the measure  $\angle POQ$ ?

- (a)  $45^\circ$  (b)  $60^\circ$   
 (c)  $75^\circ$  (d)  $90^\circ$

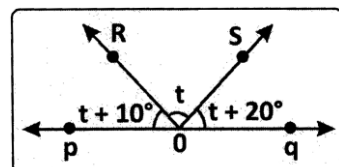
43. In the figure, ACE, BCF and DCG are straight lines and  $AB \parallel HC$ .



Find the angles  $p$ ,  $q$ ,  $r$  and  $s$ .

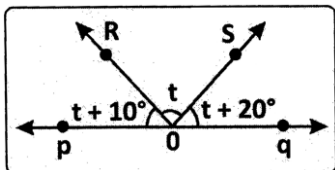
	p	q	r	s
(A)	$45^\circ$	$50^\circ$	$65^\circ$	$50^\circ$
(B)	$45^\circ$	$65^\circ$	$50^\circ$	$50^\circ$
(C)	$45^\circ$	$65^\circ$	$50^\circ$	$65^\circ$
(D)	$45^\circ$	$50^\circ$	$65^\circ$	$65^\circ$

44. In the figure given, what is the value of  $\angle t$ ?



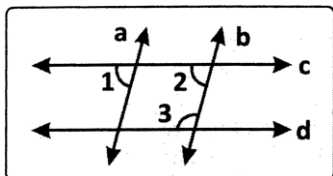
- (a)  $30^\circ$  (b)  $40^\circ$   
 (c)  $50^\circ$  (d)  $60^\circ$

45. In the figure given, if  $AB \parallel CD$ , what are the respective values of 'p' and 'q'?



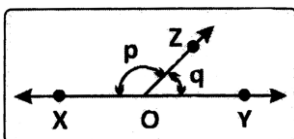
- (a)  $75^\circ$  and  $20^\circ$  (b)  $20^\circ$  and  $75^\circ$   
 (c)  $25^\circ$  and  $70^\circ$  (d)  $70^\circ$  and  $25^\circ$

46. In the figure given,  $a \parallel b$  and  $c \parallel d$ . If  $\angle 1 = 75^\circ$ , what is the measure of  $\angle 3$ ?



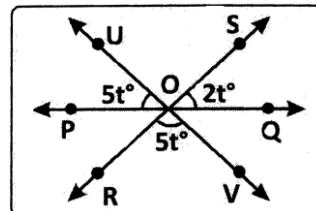
- (a)  $105^\circ$  (b)  $105^\circ$   
 (c)  $75^\circ$  (d)  $100^\circ$

47. In the figure given,  $\angle XOZ$  and  $\angle YOZ$  form a linear pair. If  $p - q = 80^\circ$  what are the respective values of p and q?



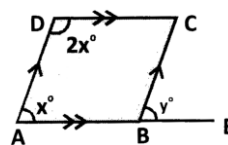
- (a)  $50^\circ$  and  $130^\circ$  (b)  $130^\circ$  and  $50^\circ$   
 (c)  $120^\circ$  and  $60^\circ$  (d)  $60^\circ$  and  $120^\circ$

48. In the figure given, what is the value of 't'?



- (a)  $5^\circ$  (b)  $10^\circ$   
 (c)  $15^\circ$  (d)  $20^\circ$

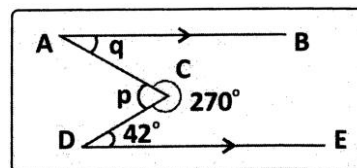
49. Given ABE is a straight line.



Find angle y.

- (a)  $60^\circ$  (b)  $120^\circ$   
 (c)  $150^\circ$  (d)  $30^\circ$

50. In the given figure, what is the measure of q?

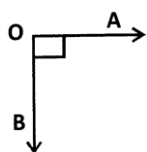


- (a)  $48^\circ$  (b)  $90^\circ$   
 (c)  $42^\circ$  (d)  $110^\circ$

## Solution

1. (C) A common unit of measurement of angles is degrees.

2. (C) An angle which exactly measures  $90^\circ$  is called a right angle.

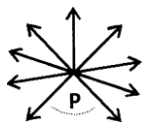


3. (C) Not available

4. (C) Not available

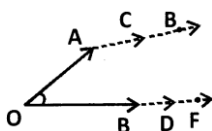
5. (C) Not available

6. (D) An infinite number of rays can be drawn from a point.



7. (A) An angle which lies between  $90^\circ$  and  $180^\circ$  is called as an obtuse angle. So,  $169^\circ$  is an obtuse angle.

8. (C) Extending the arms of an angle does not affect the angle between them.



9. (C) The vertex of an angle is the common point of the rays that form the arms of an angle. Here, it is O.

10. (A)  $\overrightarrow{ED}$  and  $\overrightarrow{EF}$  are the two arms of  $\angle DEF$ .

11. (B) Perpendicular segments meet at a point forming right angles.

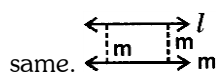
12. (A) Not available

13. (C) Not available

14. (D) Not available

15. (C) Not available

16. (A) The distance between the parallel lines is the



17. (A) There are two pairs of parallel lines as the opposite sides of a rectangle are parallel.

18. (A) Complementary angles add up to  $90^\circ$ .  $\angle PQR = 20^\circ \Rightarrow$  Its complementary angle is  $90^\circ - 20^\circ = 70^\circ$

19. (C) The sum of supplementary angles is  $180^\circ$ .  $\angle ABC = 120^\circ \Rightarrow$  Its supplementary angles add up to  $180^\circ$ .

20. (A) Not available

21. (C) Not available

22. (B) Not available

23. (A) Not available

24. (A)  $l \parallel m$ ,  $n$  is the transversal, 'a' is an exterior angle and 'p' is an interior angle both on the same side of  $n$ .

So, 'a' and 'p' are corresponding angles.

25. (B)  $l \parallel m$ ,  $n$  is the transversal, 'c' and 'p' are both interior angles, but on different sides of  $n$ . So, 'c' and 'p' are alternate angles.

**26.** (C)  $c$  and  $r$  are corresponding angles as ' $c$ ' interior and ' $r$ ' is exterior angle both on the same side of ' $n$ '.

**27.** (D)  $p$  and  $r$  are vertically opposite angles formed at the intersection of  $n$  and  $m$ .

**28.** (C)  $c$  and  $s$  are interior angles on the same side of transversal, which are supplementary. So, if  $c = 110^\circ$ , ' $s$ ' measures  $180^\circ - 110^\circ = 70^\circ$ .

**29.** (B) Not available

**30.** (A) Not available

**31.** (B) Not available

**32.** (B) Not available

**33.** (A) Not available

**34.** (B)  $PR$  is a straight line and so,  
 $x = 180^\circ - 32^\circ = 148^\circ$ .

**35.** (A) From the figure,

$$\angle AOC = 50^\circ$$

(Vertically opposite angles)

Given  $y$  is thrice  $x$ , we have

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

(Angle on a straight line)

$$\Rightarrow x + 50^\circ + 3x = 180^\circ$$

$$\Rightarrow x = \frac{130^\circ}{4} = 32.5^\circ$$

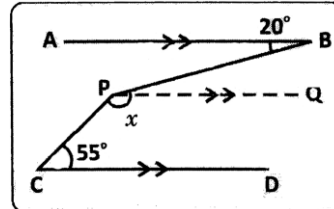
$$\therefore y = 3x = 3(32.5) = 97.5^\circ$$

**36.** (B)  $115^\circ$  and  $q$  are interior angles on the same side of the transversal.

$$\text{So, } 115^\circ + q = 180^\circ$$

$$\Rightarrow q = 180^\circ - 115^\circ = 65^\circ$$

**37.** (D) Draw  $PQ \parallel AB$  and  $CD$ .



From the figure,

$$x = 20^\circ + (180^\circ - 55^\circ)$$

$$PQ \parallel AB \parallel CD.$$

$$\Rightarrow x = 20^\circ + 125^\circ = 145^\circ$$

**38.** (D)  $a + b + c = 180^\circ$

(Sum of angles in a triangle)

$$\text{Also, } x + a + y = 180^\circ$$

(Angle on a straight line)

$$\therefore a + b + c = x + a + y$$

**39.** (B)  $DF \parallel CH \parallel BG$

$$\Rightarrow a + b = x \text{ and } a = 45^\circ$$

(Corresponding angles)

$$b = 180^\circ - 100^\circ = 80^\circ$$

(Angles on the same side of transversal.)

$$\Rightarrow x = a + b = 45^\circ + 80^\circ = 125^\circ$$

**40.** (C) From the figure,

$$150 - x + 70 - x + x = 180^\circ$$

$$\Rightarrow x = 220^\circ - 180^\circ = 40^\circ$$

Since  $AE \parallel BD$ ,  $AE \parallel BD$ ,  $y = x$  as they are alternate angles.

In  $\triangle BCD$ ,  $\angle BDC = x$  (Alternate angles)

$$70 - x + x + z = 180^\circ \Rightarrow z = 110^\circ$$

$\therefore$  The required sum

$$= x + y + z = 40^\circ + 40^\circ + 110^\circ = 190^\circ$$

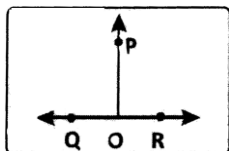
- 41.** (A) Given, the angles  $(2a - 10)^\circ$  and  $(a - 11)^\circ$  are complementary angles.

$$\therefore (2a - 10)^\circ + (a - 11)^\circ = 90^\circ$$

$$\therefore a = 37^\circ$$

- 42.** (D) Given OP is a ray on line QR.

Also  $\angle POQ = \angle POR$ .



$$\angle POQ = \angle POR \quad \dots\dots(i)$$

$$\angle POQ + \angle POR = 180^\circ \quad \dots\dots(ii)$$

From (1) and (2), we have

$$2\angle POQ = 180^\circ$$

$$\Rightarrow \angle POQ = \frac{180^\circ}{2} = 90^\circ$$

- 43.** (A) In  $\triangle ABC$ ,  $r = 180^\circ - 50^\circ - 65^\circ = 65^\circ$

$HC \parallel AB \Rightarrow q = 50^\circ$ . (Alternate angles)

$s = q$  (Vertically opposite angles) Hence,

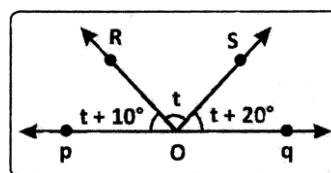
Since BCF is a straight line,

$$p + 20^\circ + q + r = 180^\circ \Rightarrow p = 45^\circ$$

$$\therefore p = 45^\circ, q = 50^\circ, r = 65^\circ$$

and  $s = 50^\circ$  are the required values.

**44.**



In the given figure,

$$t + 10^\circ + t + t + 20^\circ = 180^\circ$$

$$\Rightarrow t = 50^\circ$$

- 45.** (D) The lines AB and EF intersect at G.

$$\therefore \angle EGB = \angle AGF$$

(Vertically opposite angles)

$$\Rightarrow \angle AGF = 65^\circ$$

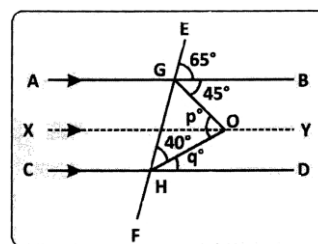
Since  $AB \parallel CD$ ,

$$\angle GHD = \angle AGH = \angle AGF$$

$$\Rightarrow \angle GHD = 65^\circ$$

$$\Rightarrow \angle GHO + \angle OHD = 65^\circ$$

$$\Rightarrow q^\circ = 65^\circ - 40^\circ = 25^\circ$$



Draw a line XY through 'O' parallel to AB and CD.

Since  $XY \parallel AB$ ,  $\angle XOG = \angle BGO$

$$\Rightarrow \angle XOG = 45^\circ \text{ (Alternate angles)}$$

and  $XY \parallel CD \Rightarrow \angle XOH = \angle OHD$

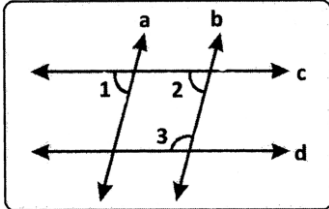
$$\Rightarrow \angle XOH = 25^\circ$$

$$\text{But } p = 45^\circ + 25^\circ = 70^\circ$$

$$\therefore p = 70^\circ \text{ \& } q = 25^\circ$$

46. (A) Given  $a \parallel b$  and  $c \parallel d$  and  $\angle 1 = 75^\circ$

Since  $a \parallel b$ ,  $\angle 1 = \angle 2$



Also  $c \parallel d$ ,  $\Rightarrow \angle 2 + \angle 3 = 180^\circ$

$$\therefore \angle 3 = 105^\circ$$

47. (B) Not available

48. (C) Not available

49. (A) Given  $AD \parallel BC \Rightarrow x = y$

(Corresponding angles)

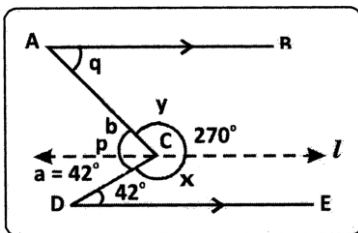
Also  $AB \parallel CD \Rightarrow x + 2x = 180^\circ$

$$\Rightarrow x = 60^\circ \text{ and } y = 60^\circ$$

50. Clearly  $p = 360^\circ - 270^\circ = 90^\circ$

(Angles at a point)

Through C, draw a line Z parallel to AB and DE.



$$\therefore 42^\circ + x = 180^\circ \text{ and } q + y = 180^\circ$$

$$\Rightarrow x = 180^\circ - 42^\circ = 138^\circ$$

$$\therefore y = 270^\circ - 138^\circ = 132^\circ$$

$$\therefore q = 180^\circ - 132^\circ = 48^\circ$$