

**Solution**  
**CLASS 7 MATHEMATICS WORKSHEET -5 ( UPTO JULY 2023) - LINES AND ANGLES**  
**Class 07 - Mathematics**  
**Section A**

1.

(c)  $150^{\circ}$ **Explanation:** Let first angle = x

Second angle = 5x

We know that supplementary angle are  $180^{\circ}$ Then,  $x + 5x = 180^{\circ}$  $6x = 180^{\circ}$  $x = 30^{\circ}$ Its supplementary  $5x = 5 \times 30^{\circ} = 150^{\circ}$ 

2. (a) supplementary

**Explanation:** When the sum of the measures of two angles is  $180^{\circ}$ , the angles are called supplementary angles. $x - 10^{\circ} + 190^{\circ} - x = 180^{\circ}$  $190^{\circ} - 10^{\circ} = 180^{\circ}$  $180^{\circ} = 180^{\circ}$ 

LHS = RHS

3.

(d)  $110^{\circ}$ ,  $70^{\circ}$ **Explanation:** We know that two angles are supplementary when they add up to 180 degrees.Here, first angle =  $110^{\circ}$ Second angle =  $70^{\circ}$ Then,  $110^{\circ} + 70^{\circ} = 180^{\circ}$ 

Thus, these Angles are Supplementary.

4. (a)  $115^{\circ}$ **Explanation:**  $AB \parallel CD$  $\angle ABE = 100^{\circ}$  $\angle BED = 15^{\circ}$ 

Extend CD to point F on BF

 $\angle ABF = \angle CFE$  (corresponding angles) $\angle CFE = 100^{\circ} = \angle DFE$ In  $\triangle DFE$  $\angle CDE$  is a exterior angle $\angle CDE = \angle DFE + \angle FED$  $= 100^{\circ} + 15^{\circ}$  $= 115$ 

5.

(c)  $70^{\circ}$ **Explanation:**  $\therefore \angle XEA = \angle BEF = 110^{\circ}$  [vertically opposite angles] $\therefore \angle BEF + \angle EFD = 180^{\circ}$  [co-interior angles] $\Rightarrow \angle EFD = 180^{\circ} - 110^{\circ} = 70^{\circ}$

6. (a)  $120^\circ$

**Explanation:** When the sum of the measures of two angles is  $180^\circ$ , the angles are called supplementary angles.

$$P + Q = 180^\circ$$

$$60^\circ + Q = 180^\circ$$

$$Q = 180^\circ - 60^\circ$$

$$Q = 120^\circ$$

7.

(b)  $50^\circ, 40^\circ$

**Explanation:** We know that two angles are complementary when they add up to 90 degrees.

Here, first angle =  $50^\circ$

Second angle =  $40^\circ$

Then,  $50^\circ + 40^\circ = 90^\circ$

Thus, these Angles are Complementary.

8.

(b)  $30^\circ$

**Explanation:** Let the angle be  $x^\circ$

A/q

$$x = \frac{1}{5} (180 - x)$$

$$5x = 180 - x$$

$$6x = 180^\circ$$

$$x = \frac{180}{6}$$

$$x = 30^\circ$$

9.

(c)  $90^\circ, 90^\circ$

**Explanation:** When the sum of the measures of two angles is  $180^\circ$ , the angles are called supplementary angles.

10.

(c)  $72^\circ$

**Explanation:** Let the angles be  $3x$  and  $7x$ .

Since, angles are supplementary

$$\text{So, } 3x + 7x = 180^\circ \Rightarrow 10x = 180^\circ \Rightarrow x = 18^\circ$$

$\therefore$  Angles are  $3 \times 18^\circ$  i.e.,  $54^\circ$  and  $7 \times 18^\circ$  i.e.,  $126^\circ$

$\therefore$  Required difference =  $126^\circ - 54^\circ = 72^\circ$

### Section B

11. (a) True

**Explanation:** True

12. (a) True

**Explanation:** True

13. (a) True

**Explanation:** True

14. 1. Parallel

15. 1. Interior angles

16. 1. 180

17.

(b) Both A and R are true but R is not the correct explanation of A.

**Explanation:** Parallel lines are lines in a plane that are always the same distance apart. Parallel lines never intersect.

If two parallel lines are intersected by a transversal then the pair of alternate interior angles are equal.

So, (A) and (R) are the true statement and (R) is not the reason for (A).

18. (a) Both A and R are true and R is the correct explanation of A.

**Explanation:** If two parallel lines are cut by a transversal, then the alternate interior angles are equal. So, The measure of the alternate angle of  $65^\circ$  is  $65^\circ$ .

So, (A) and (R) are the true statement and (R) is the reason for (A).

19.

- (b) Both A and R are true but R is not the correct explanation of A.

**Explanation:** If the sum of the measures of two angles is 90 degrees, the angles are called complementary angles.

An acute angle is a type of angle that measures less than  $90^\circ$  i.e. measure between  $0^\circ$  to  $90^\circ$ . So, two acute angles can be complementary.

So, (A) and (R) are the true statement and (R) is not the reason for (A).

20.

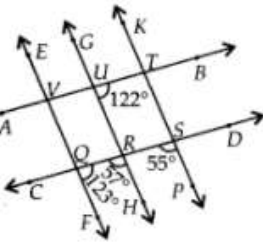
- (b) Both A and R are true but R is not the correct explanation of A.

**Explanation:** A straight angle is an angle equal to 180 degrees. It is called straight because it appears as a straight line. The sum of angles on a straight line is half of a full turn, which is  $180^\circ$ .

So, (A) and (R) are the true statement and (R) is not the reason for (A).

### Section C

21.



$$\angle FQR + \angle QRH = 123^\circ + 57^\circ = 180^\circ$$

These angles are on the same side of the transversal CD.

$\therefore EF \parallel GH$

Now,  $EF \parallel GH$  and  $AB$  is a transversal.

$\therefore \angle TUR = \angle UVQ = 122^\circ$  [Corresponding angles]

As  $\angle UVQ$  and  $\angle RQF$  are corresponding angles and are not equal.

$\therefore AB$  and  $CD$  are not parallel lines.

22. i.  $\angle 1$  and  $\angle 5$ ,  $\angle 2$  and  $\angle 6$ ,  $\angle 4$  and  $\angle 8$ ,  $\angle 3$  and  $\angle 7$

ii.  $\angle 3$  and  $\angle 5$ ,  $\angle 2$  and  $\angle 8$

iii.  $\angle 3$  and  $\angle 8$ ,  $\angle 2$  and  $\angle 5$

iv.  $\angle 1$  and  $\angle 3$ ,  $\angle 2$  and  $\angle 4$ ,  $\angle 5$  and  $\angle 7$ ,  $\angle 6$  and  $\angle 8$

23.  $\angle 4 = \angle 2$  (vertically opposite angles)

$$\angle 4 = 5x, \angle 2 = 91 - 2x$$

$$5x = 91 - 2x$$

$$5x + 2x = 91$$

$$7x = 91$$

$$x = \frac{91}{7}$$

$$x = 13$$

24. Yes,

$\angle BOD$  and  $\angle DOA$  are supplementary because:

Both the angles have common vertex  $O$  and a common arm  $OD$

Also,

The non-common arms of both the angles are opposite to each other in direction.

Hence, the angles are supplementary.

25. Since, sum of the measures of the given angles =  $115^\circ + 65^\circ = 180^\circ$

Therefore, These angles are supplementary angles.

26. From the above figure, the unknown angles can be obtained as follows:

$$\angle d = 125^\circ \text{ (Corresponding angles)}$$

$$\angle e = 180^\circ - 125^\circ = 55^\circ \text{ (Linear pair)}$$

$$\angle f = \angle e = 55^\circ \text{ (Vertically opposite angles)}$$

$$\angle c = \angle f = 55^\circ \text{ (Corresponding angles)}$$

$$\angle a = \angle e = 55^\circ \text{ (Corresponding angles)}$$

$$\angle b = \angle d = 125^\circ \text{ (Vertically opposite angles)}$$

27. Let the angle be  $x^\circ$

Complement of  $x$  is  $(90^\circ - x)$

Given that the angle is 5 times its complement

$$\Rightarrow x = 5(90^\circ - x)$$

$$\Rightarrow x = 450^\circ - 5x$$

$$\Rightarrow 6x = 450^\circ$$

$$\Rightarrow x = \frac{450}{6} = 75^\circ$$

Hence, the angle which is 5 times to its complement ( $15^\circ$ ) is  $75^\circ$

28. From the above figure it can be clearly seen that:

$\angle x$  is equal to  $100^\circ$  as they are corresponding angles

Therefore,  $\angle x = 100^\circ$

29. We know that:

Two angles are complementary if sum of their measures is  $90^\circ$

Here, the pair of angles is  $63^\circ$  and  $27^\circ$

$$\text{Sum of the measures of these angles} = 63^\circ + 27^\circ = 90^\circ$$

As the sum of these angles is equal to  $90^\circ$

Therefore, these angles are complementary angles.

30. Let one angle be  $x$  and others are  $y$ .

Since a transversal intersects two parallel lines, then interior angles on the same side of a transversal are supplementary.

$$\therefore x + y = 180^\circ \dots(i)$$

$$\text{and } x - y = 20^\circ \dots(ii) \text{ [Given]}$$

Adding (i) and (ii), we get

$$2x = 180^\circ + 20^\circ = 200^\circ$$

$$\Rightarrow x = \frac{200^\circ}{2} = 100^\circ$$

Putting value of  $x$  in (i), we get

$$100^\circ + y = 180$$

$$\Rightarrow y = 180^\circ - 100^\circ = 80^\circ$$

Thus, one angle is  $100^\circ$  and other is  $80^\circ$

## Section D

31. Let first angle be  $x$ .

Then its complementary angle is  $90^\circ - x$

According to the given problem, we have

$$\frac{x}{90^\circ - x} = \frac{7}{11}$$

$$\Rightarrow 11x = 630^\circ - 7x$$

$$\Rightarrow 11x + 7x = 630^\circ$$

$$\Rightarrow 18x = 630^\circ$$

$$\text{Thus, } x = 630/18 = 35$$

$$x = 35^\circ$$

$$\text{Hence, first angle} = 35^\circ$$

$$\text{and second angle} = 90^\circ - x = 90^\circ - 35^\circ = 55^\circ$$

32. Let required angle be  $x$

$$\text{Then its supplement} = 180^\circ - x$$

According to the given problem, we have

$$x = 180^\circ - x - 32^\circ$$

$$\Rightarrow x + x = 180^\circ - 32^\circ$$

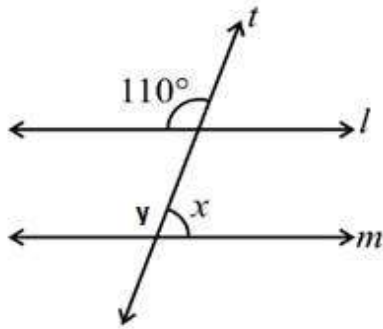
$$\Rightarrow 2x = 148^\circ$$

$$\Rightarrow x = 148/2 = 74$$

$$x = 74^\circ$$

Hence, the required angle is  $74^\circ$ .

33. From the above figure, we have



$$\angle y = 110^\circ \text{ (Corresponding angles)}$$

Also,

$\angle x$  and  $\angle y$  form a linear pair of angles. Therefore,

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

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

$$x = 180^\circ - 110^\circ$$

$$\angle x = 70^\circ$$

Hence, value of  $\angle x$  is  $70^\circ$

34.  $l \parallel n$  and  $q$  is a transversal.

$$\therefore 6a = 120^\circ \text{ [Corresponding angles]}$$

$$\Rightarrow a = \frac{120^\circ}{6} = 20^\circ$$

Now,  $p \parallel q$  and  $n$  is a transversal.

$$\therefore 4c = 120^\circ \text{ [Corresponding angles]}$$

$$\Rightarrow c = \frac{120^\circ}{4} = 30^\circ \dots(i)$$

Also,  $m \parallel n$  and  $p$  are transversal.

$$\therefore 4c = 3b \text{ [Corresponding angles]}$$

$$\Rightarrow 4 \times 30^\circ = 3b \dots[\text{using (i)}]$$

$$\Rightarrow b = \frac{120^\circ}{3} = 40^\circ$$

Thus,  $a = 20^\circ$ ,  $b = 40^\circ$  and  $c = 30^\circ$

35. i.  $\angle AOD$  and  $\angle DOB$ ;  $\angle DOB$  and  $\angle BOC$ ,  $\angle BOC$ , and  $\angle AOC$ ;  $\angle AOC$ , and  $\angle AOD$  are four pairs of supplementary angles.

ii.  $\angle POS$  and  $\angle SOQ$ ;  $\angle POR$  and  $\angle ROQ$  are two pairs of supplementary angles.

iii.  $\angle 1$  and  $\angle 2$ ,  $\angle 3$  and  $\angle 4$ ,  $\angle 5$ , and  $\angle 6$  are three pairs of supplementary angles.

**Section E**36.  $AB \parallel CD$  $\therefore \angle PEB = \angle EFD$  [corresponding angles]

$$\Rightarrow 75^\circ = 25^\circ + y$$

$$\Rightarrow y = 75^\circ - 25^\circ = 50^\circ$$

But  $\angle PEB + \angle BEF = 180^\circ$  (Linear pair)

$$\therefore 75^\circ + 20^\circ + \angle 1 = 180^\circ$$

$$\Rightarrow \angle 1 + 95^\circ = 180^\circ$$

$$\Rightarrow \angle 1 = 180^\circ - 95^\circ$$

$$\Rightarrow \angle 1 = 85^\circ$$

In  $\triangle EFG$ ,  $\angle GEF + \angle EFG + \angle EGF = 180^\circ$  (Sum of angles of a triangle)

$$\Rightarrow \angle 1 + 25^\circ + x = 180^\circ$$

$$\Rightarrow 85^\circ + 25^\circ + x = 180^\circ$$

$$\Rightarrow 110^\circ + x = 180^\circ$$

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

Hence,  $x = 70^\circ$ ,  $y = 50^\circ$ 37. If one angle =  $x$ Its supplementary angle =  $180^\circ - x$ 

$$x = \frac{1}{9}(180^\circ - x)$$

$$9x = 180^\circ - x$$

$$9x + x = 180^\circ$$

$$10x = 180^\circ$$

$$x = 180^\circ/10^\circ$$

$$x = 18^\circ$$

38. Solution: If  $m \parallel n$  and  $p$  and  $q$  are transversals

$$\angle 1 = \angle 2 = 123^\circ$$
 (alternate interior angles)

$$\angle 3 + \angle 2 = 180^\circ$$
 (Linear pair)

$$\angle 3 + 123^\circ = 180^\circ$$

$$\angle 3 = 180^\circ - 123^\circ = 57^\circ$$

$$\angle 4 + \angle 6 = 180^\circ$$

$$85^\circ + \angle 6 = 180^\circ$$

$$\angle 6 = 180^\circ - 85^\circ$$

$$\angle 6 = 95^\circ$$

$$\angle 5 = 95^\circ$$
 (alternate exterior angles)

$$\angle 2 = 123^\circ, \angle 3 = 57^\circ, \angle 5 = 95^\circ, \angle 6 = 95^\circ$$

**Section F**

39. Read the text carefully and answer the questions:

The ratio of angles made by hour hand and second hand to minute hand and second hand is 3:2. Answer the following questions.



(i) 1. complementary angles

(ii) (d)  $54^\circ$ **Explanation:**  $54^\circ$ (iii) (c)  $36^\circ$ **Explanation:**  $36^\circ$

(iv) **(c)** Complementary angles

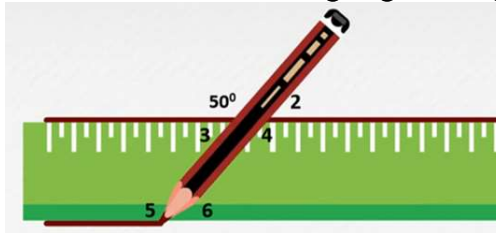
**Explanation:** Complementary angles

(v) **(b)** False

**Explanation:** False

40. **Read the text carefully and answer the questions:**

Geeta is drawing line with ruler and pencil. The angle made by pencil with a ruler edge is  $50^\circ$  as shown below. Find the remaining angles using the concept of parallel lines and transversal.



(i) 1.  $130^\circ$

(ii) **(d)**  $130^\circ$

**Explanation:**  $130^\circ$

(iii) **(a)**  $130^\circ$

**Explanation:**  $130^\circ$

(iv) **(d)**  $50^\circ$

**Explanation:**  $50^\circ$

(v) **(a)** True

**Explanation:** True