CHAPTER 4: EXPRESSIONS USING LETTERS AND NUMBERS

CHOOSE THE CORRECT ANSWER

Q1: One plate of dosa costs ₹50, and one plate of idlis costs ₹30. If x plates of dosa and y plates of idli are ordered, which expression represents the total amount earned in rupees?

a) 50x - 30y   b) 50x + 30y   c) (50 + 30) x (x + y)   d) 30x + 50y

Q2: A flour mill takes 12 seconds to start and 6 seconds per kg of grain to grind. Which expression describes the time to grind z kg of grain, starting from off?

a) 12 + 6 + z   b) 12 x 6 x z   c) 12 + 6 x z   d) (12 + 6) x z

Q3: For a matchstick pattern, the number of matchsticks in step y is given by 4y + 1. How many matchsticks are needed for step 5?

a) 22   b) 21   c) 18   d) 28

Q4: A shop rents out chairs and tables. The net cost for x chairs and y tables is 25x + 60y. What is the cost for 3 chairs and 2 tables?

a) 195   b) 206   c) 155   d) 135

5. If x represents a number, which expression represents 7 more than twice the number?

a) 2x + 7   b) 7x + 2   c) 2x – 7   d) x + 14

Assertion and Reason Question

6.Assertion (A): The expression 2x + 3y is equal to 5xy.

Reason (R): We can add or subtract like terms together.

A) Both A and R are true and R is the correct explanation of A

B) Both A and R are true but R is not the correct explanation of A

C) A is true but R is false

D) A is false and R is true

7.Assertion (A): The expression 3(x + 2) + 4x simplifies to 7x + 6.

Reason (R): We can apply distributive law: 3(x + 2) = 3x + 6, then combine like terms 3x + 4x = 7x.

A) Both A and R are true and R is the correct explanation of A

B) Both A and R are true but R is not the correct explanation of A

C) A is true but R is false.

D) A is false and R is true

SOLVE THE FOLLOWING

8. Subtract the expression

a)5x - 3y + 7 from 8x + 2y – 4.

b)9c+2d-6 from 11c-5d-8.

9. Simplify the expression

a) 5x + 2y - 3x + 4y - 7.

b)15x+2y-9+7x-(5-6y)

10. Maya makes matchstick patterns with W's, each requiring 4 matchsticks. Write an expression for the number of matchsticks needed for n W's and calculate the number needed for 10 W's.

11. A garden hose is 15 meters long. An additional hose of length m meters is attached to it. Write an expression for the total length of the hose. If m = 8 meters, find the total length.

12. A student scores 4p points for each correct answer and loses 2q points for each incorrect answer in a quiz. In three rounds, their scores are 4p - 2q, 3p - q, and 5p - 3q. Write and simplify an expression for the total score. If p = 5 and q = 1, find the total score.

13. What is the sum of the numbers in the picture below. Try it adding in different two ways.is the sum same?

CASE STUDY

14.For the school science fair, a group of students buys materials. They purchase p packets of colored paper and q packets of clay. Each packet of colored paper costs ₹15, and each clay packet costs ₹20.

(a) Write an algebraic expression for the total amount spent.

(b) If the number of clay packets is twice the number of colored paper packets, write the total cost in terms of p only.

(c) When p = 6, find the number of clay packets.

(d) Calculate the total cost using your formula for p = 6

15. Ravi wants to fence his rectangular garden, which has a length of l meters and a width of w meters. The cost of fencing is ₹20 per meter.

a) Write an expression for the perimeter of the garden.

b) Write an expression for the total cost of fencing the garden.

c) If the length is 15 meters and the width is 10 meters, what is the perimeter of the garden?

d)What is the total cost of fencing the garden in this case?

Chapter – 5 Parallel and Intersecting Lines

1. **A line that intersects another pair of lines at distinct points is called**
   (a) parallel line   (b) Intersecting line   (c) Transversal   (d) perpendicular line

2. **If l is parallel to m , then find the value of x**
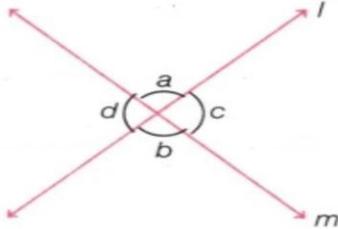   **(a) 70^0 (b) 110^0 (c) 180^0 (d) 90^0**
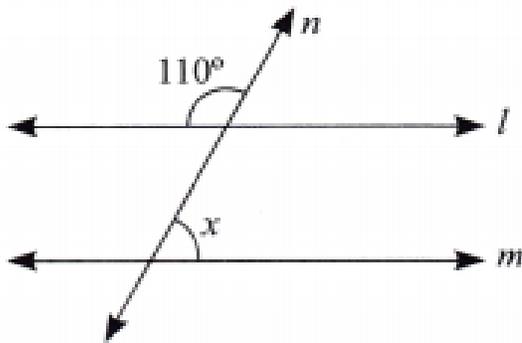
3. **Two angles form a linear pair . If one of the angle is 75^0 , what is the measure of the other angle ?**
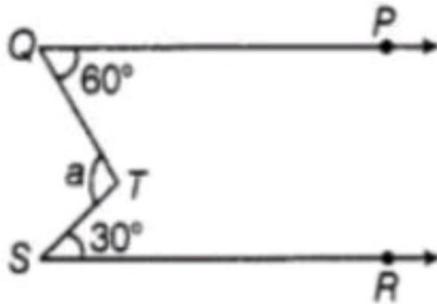
(a) 15^0 (b) 90^0 (c) 105^0 (d) 180^0

4. In the given figure , <a and <b are called
(a) Vertically opposite angles   (b) Interior angles   (c) alternate interior angles (d) linear pair

5. In the given figure , if QP and SR are parallel lines then the value of <a is
(a) 40^0 (b) 30^0 (c) 90^0 (d) 80^0

6. Perpendicular lines are a pair of lines which intersect each other at
(a) 90^0 (b) 180^0 (c) 360^0 (d) 45^0
7. If two parallel lines are intersected by a transversal then the number of pairs of corresponding angles are
(a) 1   (b) 2   (c) 3   (d) 4
8. Pair of adjacent angles whose measures add upto form a straight angle is known as
   (a) Linear pair   (b) perpendicular   (c) interior angles   (d) alternate interior angles
9. The interior angles on the same side formed by a transversal intersecting a pair of parallel lines always add upto
   (a) 90^0 (b) 360^0 (c) 180^0 (d) 270^0
10. In the given figure , AB parallel to CD , then the value of q is
   (a) 65^0 (b) 125^0 (c) 40^0 (d) 70^0
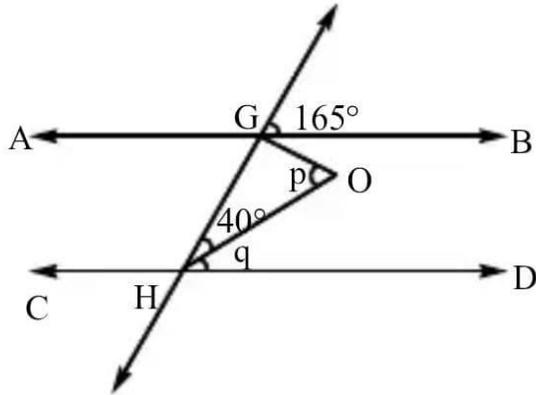
**11. If two straight lines intersect, then they have**
   (a) One common point   (b) Two common points   (c) No common point   (d) many common points .

Assertion and Reasoning :choose the appropriate option for Q. 12 and Q. 13 from below

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) Assertion is true but Reason is false.
(d) Assertion is false but Reason is true.

12 . Assertion (A) : In the given figure if / and m are parallel lines, then $\angle 1 = \angle 2$.
   Reason (R)   : When a transversal intersects a set of parallel lines, then the alternate interior angles are equal to each other.
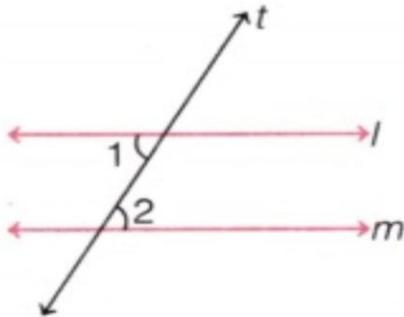
13. Assertion (A) : If two parallel lines are intersected by a transversal , then each pair of corresponding angles are equal.

   Reason (R) : A transversal intersects two parallel lines . If measure of one of the angle is 50^0 ,then the measure of its corresponding angle is 130°

   Case based study questions

14. Police officer Ahmed is assigned to monit a railway crossing in his town where the road intersect the railway line at an angle 30^0.
   (a) Identify which type of lines the two rails represent ?

(b) How many pairs of vertically opposite angles are forming ?

(c) Find the values of a,b and c . justify your answer ?
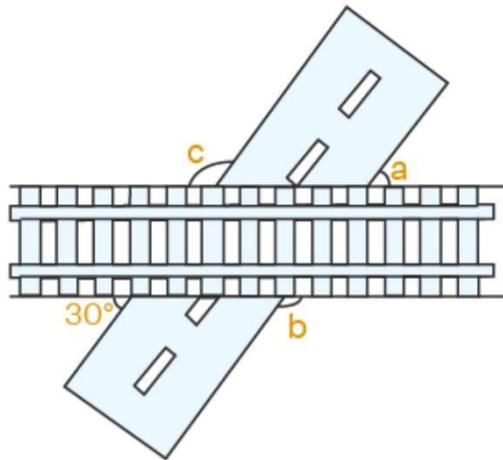
15. Adithya and Anushka were playing a game on parallel lines and the angles formed by the transversal. Adithya drew the following figure ,
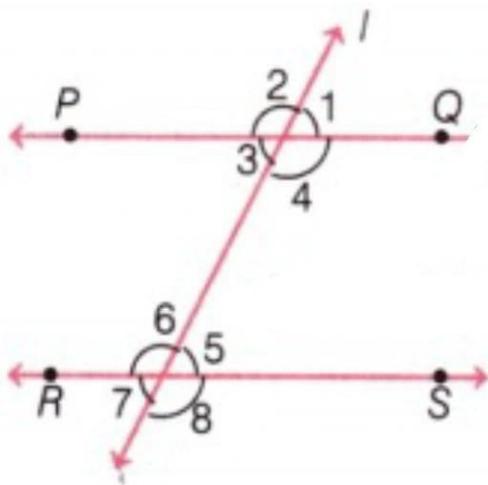
The questions asked during the game were ,

(a) If $<5 = 80^0$ what is the measure of <6 ?

(b) What is the corresponding angle of <2 ?

(c) Write two pairs of interior angles on the same side of transversal ?

Chapter 6 Number Play

I) Choose the correct answer.

1. The nth even number is given by
(a) n + 2   (b) 2n-1   (c) 2n + 1   (d) 2n
2. The parity of the expression 3 n + 2, when n = 2, is
(a) even.   (b) odd   (c) sometimes even, sometimes odd   (d) None of the above.
3. 7 th term of the Virahanka – Fibonacci sequence is
(a) 34   (b) 21   (c) 55   (d) 13
4. The expression (2n-1) represents all
(a) even numbers   (b) odd numbers   (c) both even and odd   (d) None of these
5. The product of two odd numbers is
(a) even   (b) odd   (c) sometimes even and sometimes odd   (d) None of the above

II) Assertion and reason:

6. Assertion (A) 10 th term of the Virahanka – Fibonacci sequence is 89.
   Reason (R) The Virahanka – Fibonacci numbers form a sequence where each number is the sum of two   preceding ones.
 (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 (c) Assertion is true but Reason is false.
 (d) Assertion is false but Reason is true.
7. Assertion (A) Sum of 3 even numbers and 4 odd numbers is odd.
   Reason (R) Sum of two even numbers is even and sum of two odd numbers is also even.
(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) Assertion is true but Reason is false.
(d) Assertion is false but Reason is true.

III) Answer the following question.

8. Below you will find a set of magic number puzzles. Fill in the blanks to solve the puzzle for the given magic sum:

(a) The magic sum is 27   (b) The magic sum is 42

10		
11		7
	13	

15		
16		12
	18	

9. Solve this cryptarithm:

(a)
```
      B  B
+        A
─────────
   A  C  C
```

(b)
```
         A
      B  B
+  C  C  C
──────────
   B  A  B
```

10. Neha has an odd number of ₹ 5 coins, an odd number of ₹ 10 coins and even number of ₹ 1 coins in her bag. She calculated the total and got ₹ 110. Did she make a mistake? If she did, explain why?

11. What are the next 3 numbers of the Virahanka sequence after 610 and 987 ?

(v) Case study:

12. Find the number sequence formed when the given arrangements are changed as mentioned below.
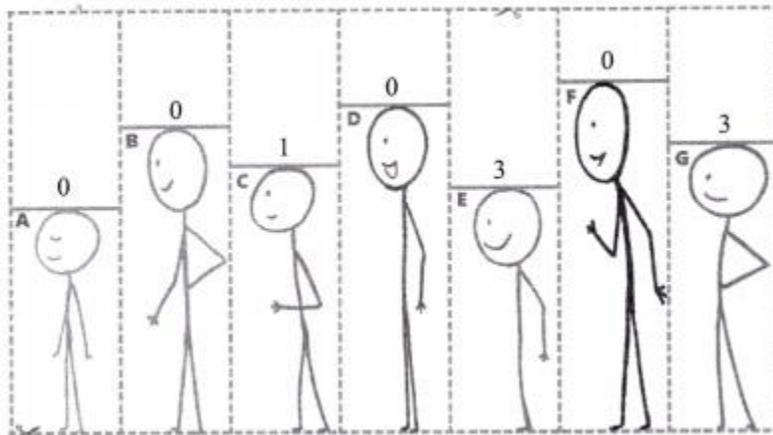

(a) BFECDAG
(b) FBCEADG
(c) FDGBCEA

Chapter 7 A Tales of three intersecting lines

I)Choose the correct answer.

1. If a, b and c are the three sides of a triangle, then
(a) a + b = c   (b) a + b < c   (c) a + b > c   (d) a – b > c
2. In a △ABC, AD is the perpendicular on BC. Then, altitude of a triangle is
(a) AD   (b) AB   (c) AC   (d) BC
3. In a △ABC, if ∠A = 60° and ∠B = 30°, then the exterior angle formed by producing B C is equal to
(a) 180°   (b) 99°   (c) 90°   (d) 105°
4. The measures of ∠x and ∠y in the given figure are respectively
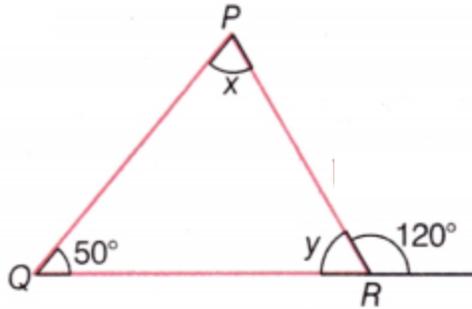
(a) 30°, 60°   (b) 40°, 40°   (c) 70°, 70°   (d) 70°, 60°
5. In the given figure, find the value of x.
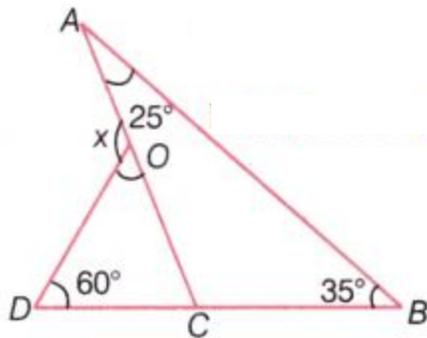
(a) 75°   (b) 90°   (c) 120°   (d) 60°
6. Which of the following cannot be the length of the third side of a triangle, whose two sides measure 10 cm and 5 cm ?
(a) 12 cm   (b) 16 cm   (c) 14 cm   (d) 13 cm
II) Assertion and reason:

7. **Assertion (A):** If two internal opposite angles of a triangle are equal and the external angle is 110°, then each internal angle is 50°.
  Reason (R): A triangle with one of its angles as 110° is called an obtuse-angled triangle.
  (a) Both assertion and reason are true and the reason is the correct explanation of assertion.
  (b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
  (c) Assertion is true and the reason is false.
  (d) Assertion is false and the reason is true.

8**. Assertion (A):** ABC is an equilateral triangle such that AB = BC = CA and ∠A = ∠B = ∠C = 60°.

  Reason (R): Equilateral triangle has all its sides equal and each angle measure 30°.
  (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
  (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
  (c) Assertion is true but Reason is false.
  (d) Assertion is false but Reason is true.
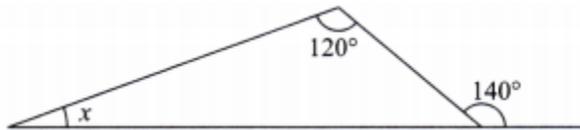
III) Answer the following question.

9. Can a triangle have side lengths 6 cm, 8 cm, and 10 cm?

10. Construct a triangle having the side lengths 5, 5, and 8. (all units are in cm)

11. Construct triangles for the following measurements:
(a) 5 cm, 40°, and 8 cm
(b) 45°, 5 cm, and 60°

12. Find the value of the unknown angle:

13. Is it possible to construct a triangle if its all angles are equal to 80 degrees?

Iv) Case study:

14. Ravi is making a photo frame in the shape of a triangle. He measures the angles and finds them to be 60° each. He also finds that all the sides are of equal length.

(i) What type of triangle is Ravi's photo frame?
(ii) What is the sum of the interior angles of Ravi's photo frame?
(iii) Will the triangle remain the same type if all angles are 70° ? Why or why not?
 The Land Surveyor

15. A land surveyor is marking boundaries for a new property. She sets three main markers at points A, B, and C. The distances between these markers are measured as follows:

Distance from A to B (AB) = 5 km

Distance from B to C (BC) = 7 km

Distance from C to A (CA) = 10 km

Questions:

Q1: Can these three markers form the corners of a valid, closed triangular property boundary?

Q2: The surveyor wants to add a fourth marker, D, inside the triangle such that the distance from A to D and D to C is minimized. What geometric principle guides the placement of marker D?

Q3: If the surveyor measures the angle at A as 30° and the angle at B as 80°, what should the angle at C be?

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