Items for Assessment of Learning Outcomes

Mathematics

Class 7

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CHAPTER: 1

TOPIC: Integers

LEARNING OBJECTIVES:

Whole Numbers and Integers:

• Differentiate between whole numbers and integers and give concrete examples.

• Represent numbers with positive and negative signs and apply to various situations.

Representation of Integers on Number:

• Represent integers on a number line and perform operations and verify properties of integers.

Properties of Addition and subtraction of integers:

• Apply properties of addition and subtraction of integers and simplify arithmetic expressions.

Multiplication of integers:

• Apply rules of multiplication of integers and solve various arithmetic expressions and contextual problems.

Properties of multiplication of integers:

• Apply properties of multiplication of integers and simplify arithmetic expressions.

• Apply properties of addition, subtraction and multiplication of integers and devise methods for easier calculation and solve problems based on real life related to integers.

Properties of division of Integers:

• Apply properties of division of integers and simplify arithmetic expressions.

LEARNING OUTCOME:

• Applies rules for multiplication and division in order to solve problems involving two integers with same or different signs.

QUESTIONS:

1. **Which number is known as the multiplicative identity for integers?**
   A. 1
   B. 0
   C. -1
   D. 2

2. Which of the following statements is wrong?
   A. When a positive integer and a negative integer are added, we always get a negative integer.
   B. Additive inverse of 8 is (-8).
   C. Additive inverse of (-8) is 8.
   D. For subtraction, we add the additive inverse of the integer that is being subtracted, to the other integer.

3. Which of the following is true?
   A. $(-8) + (-4) > (-8) - (-4)$
   B. $(-8) + (-4) < (-8) - (-4)$
   C. $(-8) + (-4) = (-8) - (-4)$
   D. $(-8) + (-4) = (+8) - (-4)$

4. The integer whose product with (-1) is 0, is_____.
   A. 1
   B. -1
   C. 0
   D. 2

5. $a \times (b + c) = a \times b + a \times c$ is called _____.
   A. commutative property
   B. associative property
   C. distributive property
   D. closure property

6. If $x \div 1 = 8$, then x is equal to _____.
   A. 8
   B. 1
   C. -8
   D. -1

7. Determine the integer whose product with (-1) is -32?
   A. 32
   B. -32
   C. 1
   D. 0

8. On a number line, when we subtract a negative integer, we _____.
   A. move to the right
   B. move to the left
   C. do not move at all
   D. origin

ANSWERS:
1. A   2. A   3. B   4. C   5. C   6. A   7. A   8. A

CHAPTER: 2
TOPIC: Fractions and Decimals

LEARNING OBJECTIVES:
Fractions:

• Define proper, improper and mixed fractions and distinguish between them.

• Multiply (or divide) numerator and denominator with the same number and write equivalent fractions.

• Convert unlike fractions into like fractions and compare them.

Multiplication of fractions:

• Extend concept of multiplication as repetitive addition for fraction and multiply a fraction and a whole number.

• Multiply fractions involving the term 'of 'multiply fractions and calculate the total number of parts.

• Multiply fractions and compare the value of the product with the original fractions.

Decimal Numbers:

• Recall and apply concept of decimal representation and expansion and perform mathematical operations on decimal.

Multiplication of Decimal numbers:

• Multiply decimal numbers by 10, 100 and 1000 and infer right shift in decimal point.

• Find the intersection of 2 decimal numbers on the grid and represent their product.

Division of decimal numbers:

• Divide decimal number by a whole number and solve real life problems related to decimals.

• Convert decimals into fractions and divide decimal number by another decimal number.

LEARNING OUTCOME:

• Applies repeated addition and subtraction in order to interpret the division and multiplication of fractions.

• Expresses a fraction as percentages and decimals in order to solve daily life problems.

- Applies algorithms for multiplication and division in order to multiply and divide fractions /decimals.
- Calculates the simple form of a fraction in order to distinguish quantities that are in proportion.

QUESTIONS:

1. Which of the following is an improper fraction?
   A. 2/7
   B. 3/7
   C. 4/5
   D. 63/10

2. Which of the following is a proper fraction?

   A. 3/7
   B. 15/2
   C. 7/5
   D. 25/7

3. The length of a rectangular sheet of paper is3/5 cm and breadth is 2/5 cm. What   is the perimeter of the paper?

   A. 1 cm
   B. 2 cm
   C. 3 cm
   D. 4 cm

4. Nisha reads 3/2 hours daily. Preeti reads 1/2hour daily. How much hours they read for in one day?

   A. 1 hour
   B. 2 hour
   C. 3/2 hour
   D. 5/2 hour

5. What is1/2 of 8?
   A. 1
   B. 2
   C. 3
   D. 4

6. There are 40 students in a class. 1/2 of the total number of students are Hindus. The number of Hindus is _____.

    A. 10

    B. 20

    C. 30

    D. 40

7. A car runs 20 km using 1 litre of petrol. How much distance will it cover in 5/4 litre of petrol?

    A. 25 km

    B. 30 km

    C. 36 km

    D. 40 km

8. Find 2/7 x 3

    A. 5/7

    B. 6/7

    C. 1/7

    D. 2/7

9. The place value of 2 in 3425 is _____.

    A. 1

    B. 2

    C. 20

    D. 0.2

10. If 43m = 0.086 then m has the value _____.

    A. 0.002

    B. 0.02

    C. 2

    D. 0.2

ANSWERS:

1) D   2) A   3) B   4) B   5) D

6) B   7) A   8) B   9) C   10) A

CHAPTER: 3
TOPIC: Data handling

LEARNING OBJECTIVES:

Collection and Representation of data	Collect, record and present data and organize experiences or information and draw inferences from them.
Organizing data	Organize raw data into tabular form and make data easier to interpret.
Representative Values	Calculate average and represent the central tendency of the data.
Arithmetic Mean	Calculate arithmetic mean and find its position in the data.
	Calculate range of the data and know the spread of the data.
Mode	Calculate mode of the data and find the observation that occurs most often in the data set.
	Calculate median of the data and find the observation that lies in the middle of the data set.
	Represent data in a bar graph using appropriate scale and represent given information in form of a bar graph.
	Represent data using double bar graph and compare and discuss two collection of data at a glance.
	Calculate probability and find the chance of occurring /not-occurring of the event/s

LEARNING OUTCOME:

• Represents data pictorially in order to interpret data using bar graph.

• Calculates mean, median and mode in order to find various representative values for simple data from her /his daily life.

• Calculates the variability in real life situation and appreciate the variation observed in real life situations.

QUESTIONS:

1. The Arithmetic Mean of 36, 35, 50, 46, 60, 55 is _____.

   A. 45

   B. 46

   C. 47

   D. 43

2. The range of the marks 85, 76, 89, 39, 54, 65 is _____.

    A. 89

    B. 39

    C. 50

    D. 60

3. The mode of the given set of numbers 2, 4,3,2,2,1,4,5 is _____.

    A. 1

    B. 2

    C. 3

    D. 5

4. The median of the data 24, 36, 46, 17, 18, 25, 35 is _____.

    A. 24

    B. 25

    C. 26

    D. 35

5. A coin is flipped to decide which team starts the game. What is the probability that your team will start?

    A. 1/2

    B. 1/3

    C. 1/4

    D. 1

Observe the pie chart given below and answer the following questions:
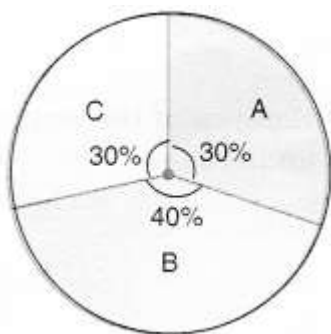
6. The central angle for sector A is ____.

    A. 108°

    B. 144°

    C. 72°

    D. 150°

7. Which sector has the greatest angle?

    A. A

    B. B

    C. C

    D. None of these

8. The central angle for sector B is _____.
    A. 108°
    B. 144°
    C. 72°
    D. 120°

9. What is the difference between the central angles for sector B and sector C?
    A. 36°
    B. 72°
    C. 9°
    D. 81°

Read the following bar graph and answer the following related questions:
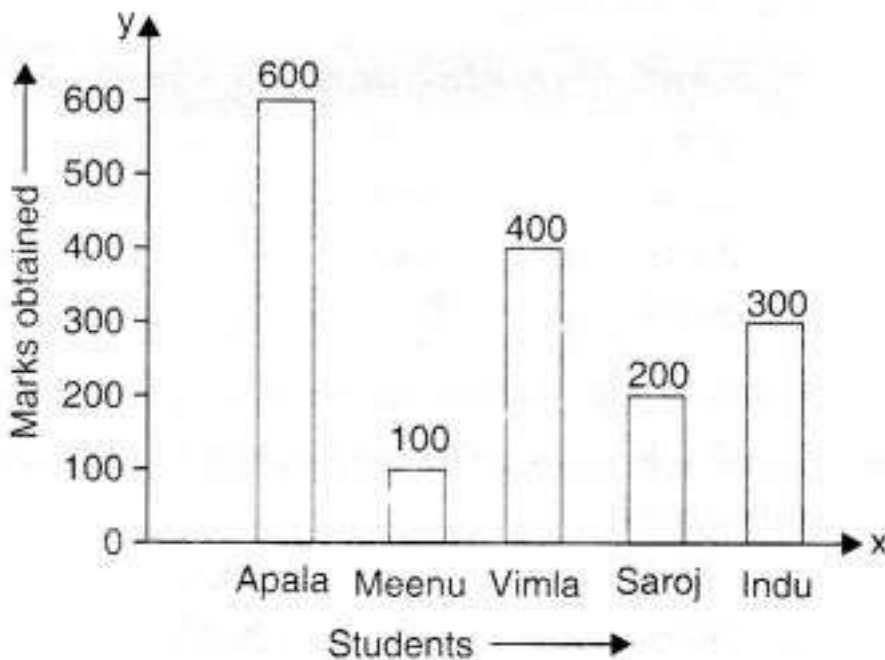
10. Who got the maximum marks?
    A. Apala
    B. Meenu
    C. Saroj
    D. Indu

11. The difference between maximum and minimum marks is _____.
    A. 100
    B. 200
    C. 400
    D. 500

ANSWERS:

1. C   2. C   3. B   4. B   5. A   6. A
7. D   8. B   9. A   10. A   11 D

TOPIC: Simple equations

LEARNING OBJECTIVES:

Setting up of an equation	Use number and variable with different operations and express a real-life situation in the form of a simple linear equation.
Review of what we Know	Convert the given equation in words and express it in statement form.
What is an equation?	Use trial and error method and determine the solution of a simple equation.
More Equation	Explain the first step to be taken and separate the variable while solving the given equation.
	Create a strategy and solve the given simple equation.
Solution to equation	Use the given solution and construct equations from it.
	Construct simple equations and solve them for the given problems /puzzles in the familiar or unfamiliar contexts .

LEARNING OUTCOME:

• Translates a real-life situation in the form of a simple algebraic equation in order to arrive at a generalized problem and solution for the situation.

QUESTIONS:

1. The sum of three times x and 11 is 32. What is the equation of this statement?

   A. $x + 11 = 32$

   B. $3x + 11 = 32$

   C. $3x + 32 = 11$

   D. $3x - 11 = 32$

2. Convert the following equation in statement form: $2n + 5 = 11$

   A. Add 5 to two times n to get 11.

   B. Add n to two times 5 to get 11.

   C. Add 5 to n to get 11.

   D. Add 5 with 11

3. The solution of $8y = 32$ is _____.

   A. 3

   B. 4

   C. 5

   D. 6

4. The sum of two times a number and 8 is 10. Find the number?

    A. 1

    B. 2

    C. 3

    D. 4

5. Write the following statement in the form of an equation:
The number b divided by 6 gives 5.

    A. $b/6 = 5$

    B. $b - 5 = 6$

    C. $5b = 6$

    D. $b + 5 = 6$

6. Write the equation of the following statement: 2 subtracted from y is 6.

    A. $6 - y = 2$

    B. $y - 2 = 6$

    C. $2 - y = 6$

    D. $2x+y = 3$

7. The value of p in the equation $p + 6 = 10$ is _____.

    A. 4

    B. 5

    C. 6

    D. 7

8. Manu's father's age is 4 years more than three times Manu's age. Find Manu's age, if his father is 46 years old.

    A. 14

    B. 15

    C. 16

    D. 13

9. Set up an equation for the following: When 9 subtracted from twice a number, the result was 11.

    A. $x - 9 = 11$

    B. $9 - 2x = 11$

    C. $2x - 9 = 11$

    D. $x-11 = 9$

10 The solution of the equation $m/5 = -3$ than m equal to _____.

    A. 2   B. -15   C. 12   D. 6

ANSWERS:

1. B   2. A   3. B   4. A   5. A   6. B   7. A   8. A   9. C   10. B

TOPIC: Lines and angles

<u>**LEARNING OBJECTIVES**</u>

Related Angles	Examine different angles and identify complementary angles.
	Examine different angles and identify supplementary angles.
	Examine different angles and determine the measure of their complement and supplement.
	Describe adjacent angles and identify a pair of adjacent angles in the given angles.
	Examine different angles and identify linear pair.
	Describe vertically opposite angles and their property and identify them in the given figure.
	Identify different types of angles and determine the measure of unknown angles in the given figure.

<u>**LEARNING OUTCOME:**</u>

• Classifies pairs of angles based on their properties in order describe linear, supplementary, complementary, adjacent and vertically opposite angles.

<u>**QUESTIONS:**</u>

1. **The sum of the measures of two complementary angles is _____.**
   A. 180°
   B. 60°
   C. 45°
   D. 90°

2. **Which of the following statements is true?**
   A. Two acute angles can be complementary to each other.
   B. Two obtuse angles can be complementary to each other.
   C. Two right angles can be complementary to each other.
   D. One obtuse angle and one acute angle can be complementary to each other.

3. **What is the measure of the complement of the angle 80°?**
   A. 10°
   B. 100°
   C. 36°
   D. 20°

4. **Which pair of the following angles are complementary?**

A.

60°   30°

B.

90°   10°

C.

55°   45°

D.

120°   60°
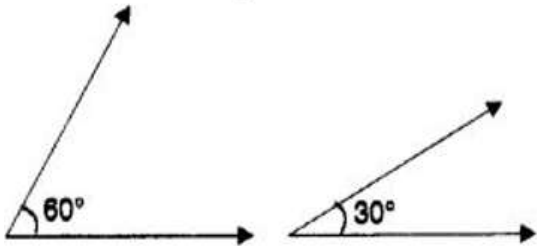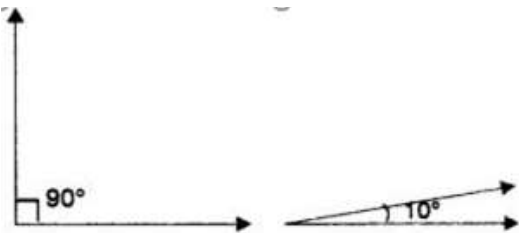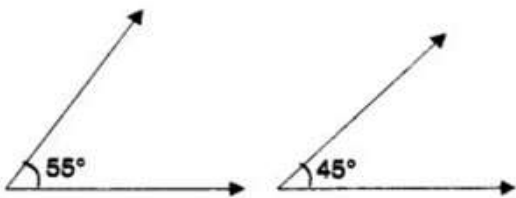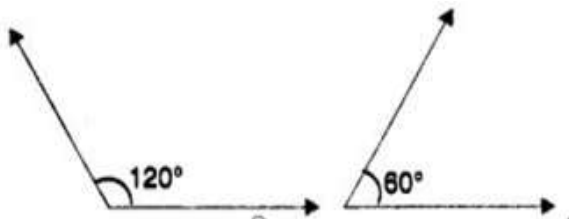
5. **The measure of the supplement of the angle 120° is**
   A. 30°
   B. 45°
   C. 60°
   D. 90°
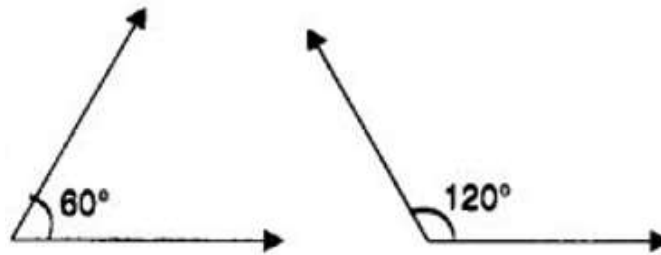
6. **Which of the following statements is true?**
   A. Two acute angles can be supplementary.
   B. Two right angles can be supplementary.
   C. Two obtuse angles can be supplementary.
   D. One obtuse angle and one acute angle cannot be supplementary.

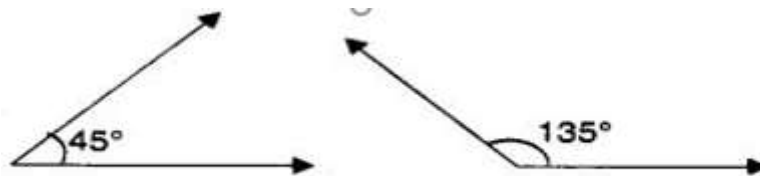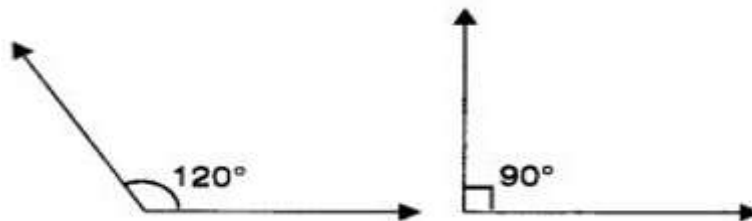**7. Which pair of the following angles are not supplementary?**
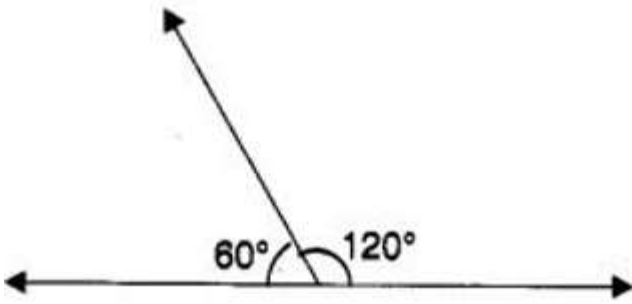
A.
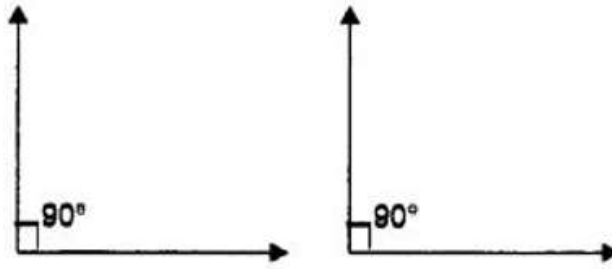
B.

C.

D.

8. Which of the following statements is true?
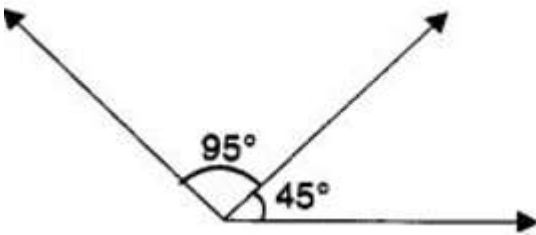
    A. Two acute angles can form a linear pair.
    B. Two obtuse angles can form a linear pair.
    C. Two right angles can form a linear pair.
    D. One obtuse angle and one acute angle cannot form a linear pair.

9. Which of the following pairs of angles form a linear pair?
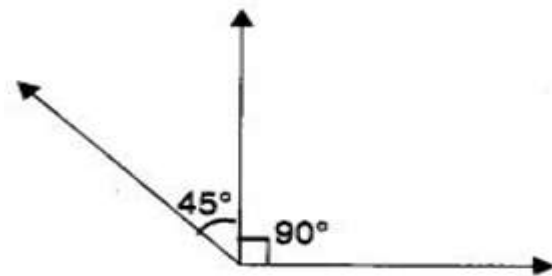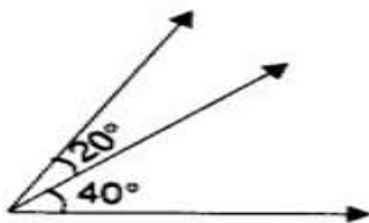
A.

B.

C.

D.

ANSWERS:

1) D   2) A   3) A   4) A   5) C
6) B   7) D   8) C   9) A

CHAPTER: 6

TOPIC: The triangle and its properties

LEARNING OBJECTIVES

Types of triangles	Compare different triangles and classify them on the basis of their sides and angles
	Recall the parts of a triangle and describe it for the given triangle.
Medians of a triangle	Describe median of a triangle and identify it for the given triangle
Altitude of a triangle	Describe altitude of a triangle and identify it for the given triangle
Exterior angle of a triangle and its property	Apply the exterior angle property of a triangle and find the measure of the unknown angle in the given triangle
Angle sum property of a triangle	Apply the angle sum property of a triangle and find the measure of unknown angle.
Measure of angle	Use appropriate property and determine the measure of the unknown angle(s) in the given figure.
Sum of lengths of 2 sides of a triangle	Apply the property of lengths of sides of a triangle and determine whether a triangle is possible for the given side lengths or not.
	Apply the Pythagoras property and verify whether the triangle for the given side lengths will be right angled triangle or not.
Right angles triangle and Pythagoras property	Apply the Pythagoras property and fine the length of the unknown side in a right-angled triangle.
	Use appropriate properties and defend whether the given triangle is possible or not.

LEARNING OUTCOME:

• Applies angle sum property of a triangle to calculate unknown angles of a triangle when its two angles are known.

QUESTIONS:

1. How many altitudes can a triangle have?

A. 1

B. 2

C. 3

D. 4

2. In a ΔABC, if AB+BC=10cm,BC+CA=12cm , CA+AB=16cm,then the perimeter of the triangle is _____.

A. 19cm

B. 17cm

C. 28cm

D. 22cm

3. An _____ angle of a triangle is equal to the sum of its interior opposite angles.

A. Exterior angle

B. Interior angle

C. Adjacent angle

D. Vertical opposite angles

4. The total measure of the three angles of a triangle is _____.
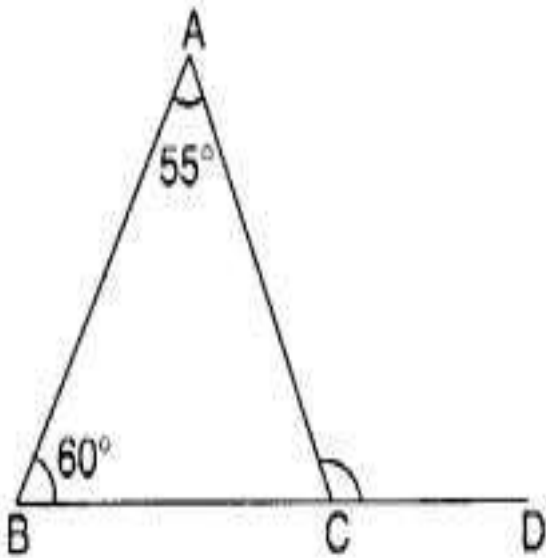
A. 90°

B. 180°

C. 360°

D 270°

5. If the two angles of a triangle are 50 degree and 70 degree, then the measure of third angle is _____.

A. 50°

B. 60°

C. 70°

D 80°

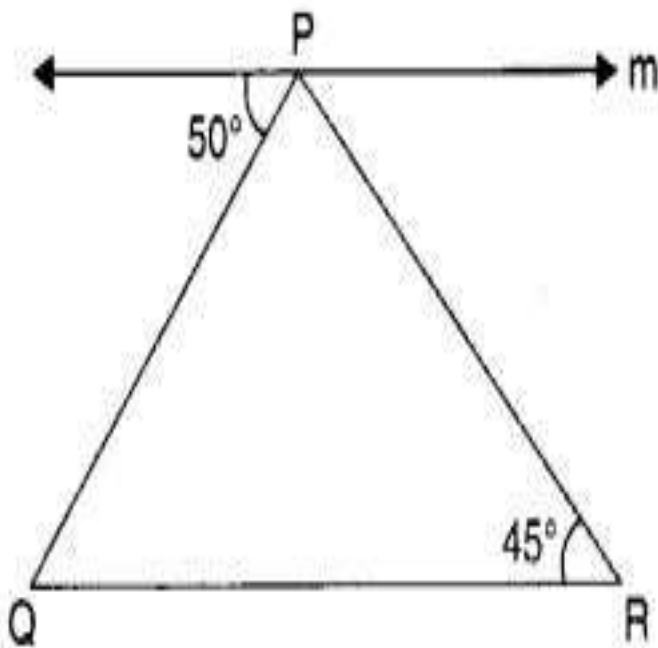**6. In the Pythagoras property, the triangle must be _____.**

A. obtuse angled

B. acute- angle

C. right-angled

D. none of these

7. In the following figure, the side BC of △ ABC is extended up to the point D. If ∠A = 55° and ∠B = 60°, then the measure of ∠ACD is

A. 120°
B. 110°
C. 115°
D. 125°

8. In the following figure, m ∥ QR. Then, the measure of ∠QPR is _____.

A. 80°
B. 85°
C. 75°
D. 70°

9. In the following figure, find ∠B.
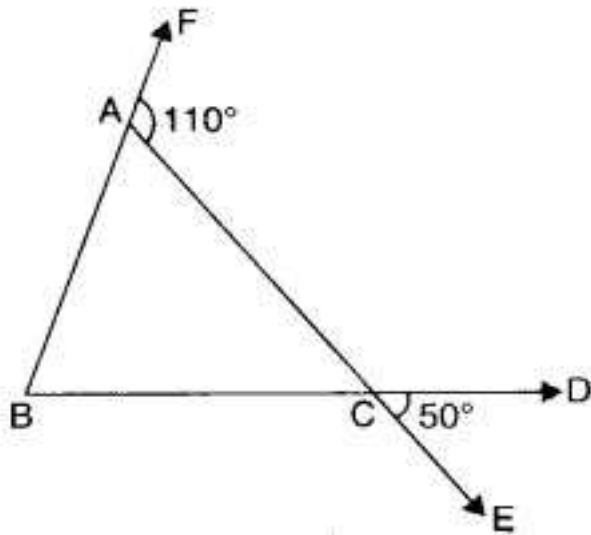
A. 30°
B. 45°
C. 40°
D. 60°

10. In the following figure, △ ABC is an equilateral triangle. Find ∠x.
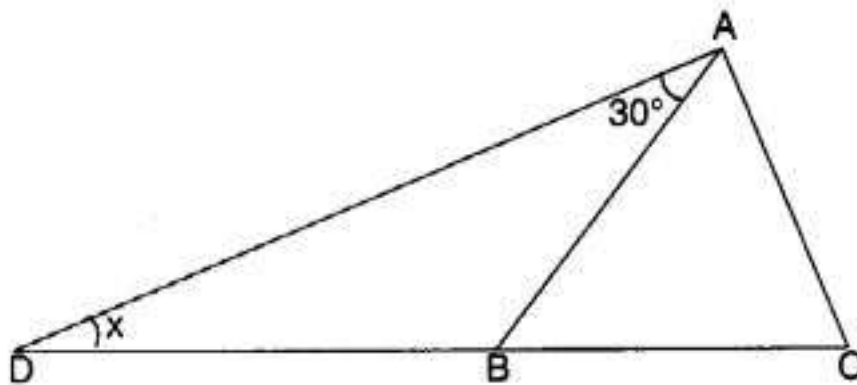
A. 30°
B. 45°
C. 60°
D. 90°

ANSWERS:

1) C   2) A   3) A   4) B   5) B
6) C   7) C   8) B   9) D   10) A

CHAPTER: 7
TOPIC: Congruence of triangles

LEARNING OBJECTIVES

Congruence of plane figures	Experiment superposition of different figures and verify congruence of two figures
Congruence among line segments	Experiment superposition of different lengths and understand congruence of two-line segments and vice versa
Congruence of angles	Experiment superposition of different angles and understand congruence of two angles and vice versa
Congruence of triangles	Give example(s) and discuss the congruence of triangles and its corresponding parts under a given correspondence.
Criterion for Congruence of Triangles	Use SSS Congruence criterion and examine whether the given triangles are congruent or not.
	Use SAS Congruence criterion and examine whether the given triangles are congruent or not.
	Use ASA Congruence criterion and examine whether the given triangles are congruent or not.
Congruence among right angles triangle	Use any appropriate criterion of congruency and check whether the given triangles are congruent or not.

LEARNING OUTCOME:

• Applies the similarity rules in order to explains the congruency of triangles on the basis of the information given about them (like SSS, SAS, ASA, RHS).

QUESTIONS:

1. Two students draw a line segment each. What is the condition for them to be congruent?
    A. They should be drawn with a scale.
    B. They should be drawn on the same sheet of paper.
    C. They should have different lengths.
    D. They should have the same length.

2. In ΔABC, AB = AC and AD is $\perp$ to BC. State the property by which ΔADB$\cong\Delta$ADC.
    A. S.A.S. property
    B. S.S.S. property
    C. R.H.S. property
    D. A.S.A. property

3. ΔABC and ΔPQR are congruent under the correspondence: ABC $\leftrightarrow$RQP, then the part of ΔABC that correspond to $\angle$Q is _____.
    A. $\angle$C
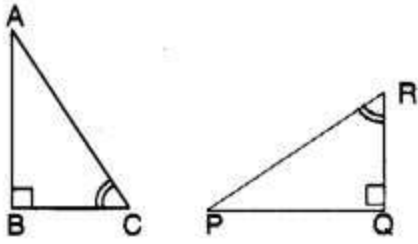   B. $\angle$A
    C. $\angle$B
    D. $\angle$P

4. To show that Δ ART $\cong\Delta$ PEN and we have to use SSS criterion. We have AR = PE and RT = EN. What more we need to show?
    A. AT = PN
    B. AT = PE
    C. AT = EN
    D. AT = NE

5. A triangle in which all three sides are of equal lengths is called …….
    A. Isosceles
    B. Equilateral
    C. Scalene
    D. Acute angled

6. If △ ABC and △ PQR are to be congruent, name one additional pair of corresponding parts

    A. BC = QR
    B. BC = PQ
    C. BC = PR
    D. BC=RQ

7. If the vertical angle of an isosceles triangle is 40°, then measure of other two angles will be _____.

    A. 60°, 60°
    B. 80°, 80°
    C. 70°, 70°
    D. 45°, 45°

8. If ΔDEF ≅ ΔBCA, then the part of ΔBCA that correspond to ∠E is

    A. ∠B
    B. ∠C
    C. ∠A
    D. ∠D

ANSWERS:

1. D	2. C	3. C	4. A	5. B
6. A	7. C	8. B		

CHAPTER: 8

TOPIC: Comparing quantities

LEARNING OBJECTIVES;

Concept of Ratios	Compare quantities and represent them as ratio.
	Compare the units of the quantities and represent them in ratio.
Equivalent ratios	Convert ratios into like fractions and compare them and identify equivalent ratios.
	Equate ratios and represent them in proportion.
	Represent equal ratios in proportion and find missing term(s).
Comparing Quantities using percentage	Convert denominators of fractions into 100 and represent them in percentages.
	Convert fractional numbers to percentage and make comparison of quantities easier.
	Convert decimal numbers to percentage and make comparing of quantities easier.
	Convert percentages to fractions or decimals and solve real life problems.
	Represent shaded part of a figure in the form of percentage and estimate the part of an area.
Use of Percentages	Interpret percentage given in a statement and infer meaning of the statement.
	Convert percentage into number and know how many of a given situation
	Convert ratios to percentages and solve problems based on real life
	Calculate increase or decrease in quantity as percentage and examine change in quantity based on real life problems
	Calculate cost and selling price and determine profit /loss percentage

Charge given on borrowed money or simple interest	Understand the concept of simple interest and interpret real life problems
	Make use of percentage and calculate simple interest for multiple years

LEARNING OUTCOME:

• Applies algorithm to calculate percentages in order to calculate profits, loss and rate of interest in simple interest calculation

QUESTIONS:

1. **Sonam bought a CD for ₹750 and sold it ₹ 875. Find her gain or loss percent.**
   A. Gain of 20%
   B. Gain of 30%
   C. Gain of 25%
   D. Gain of (50/3)%

2. **Aman bought a sweater and saved ₹ 20 when a discount of 25% was given. What was the price of the sweater before the discount?**
   A. Rs 80
   B. Rs 40
   C. Rs 60
   D. Rs 100

3. **The ratio of 15 days to 72 hours is _____.**
   A. 2 : 1
   B. 3 : 1
   C. 4 : 1
   D. 5 : 1

4. **The ages of father and son are 45 years and 10 years. The ratio of their ages is ___.**
   A. 3 : 2
   B. 5 : 2
   C. 9 : 2
   D. 15: 2

5. The cost of 3 envelopes is Rs 15. Find the cost of 5 envelopes.
   A. Rs 20
   B. Rs 25
   C. Rs 30
   D. Rs 40

6. The cost of 7 kg of potatoes is ₹42. How many kg of potatoes can be purchased for ₹96?
   A. 10 kg
   B. 12 kg
   C. 15 kg
   D. 16 kg

7. A motorcycle goes 120 km in 3 L of petrol. How much petrol will be required to go 600 km?
   A. 10 L
   B. 12 L
   C. 15 L
   D. 20 L

8. Out of 40 children in a class, 10 are boys. What is the percentage of boys?
   A. 10%
   B. 40%
   C. 4%
   D. 25%

9. Out of 25 students, 5 are absent. What per cent of the students are absent?
   A. 10%
   B. 20%
   C. 25%
   D. 30%

ANSWERS:

1. D   2. A   3. D   4. C   5. B
6. D   7. C   8. D   9. B

TOPIC: Rational Numbers

LEARNING OBJECTIVES:

What are rational numbers	Define rational numbers and classify a number as a rational number.
	Represent integers in the form of numerator /denominator where denominator is non-zero and define rational numbers.
	Multiply numerator and denominator by same non-zero integer and find equivalent rational numbers.
Positive and negative rational numbers	Define positive and negative rational numbers and classify a number as either of them.
Rational numbers on a number line	Construct a number line and represent rational numbers on it.
Rational numbers in standard form	Simplify rational number such that there is no common factor between numerator and denominator and represent the number in standard form.
Comparison of rational numbers	Determine the distance of a rational number from 0 and compare them.
Rational number between two rational numbers	Calculate and find rational numbers between any two rational numbers and infer that there are infinite rational numbers between any two given rational numbers.
Operations on rational numbers	Apply the rules of rational numbers operations and simplify arithmetic operations.

LEARNING OUTCOME:

Applies appropriate mathematical operations on rational numbers in order to solve problems related to daily life situations

QUESTIONS:

1. ___ is the multiplicative identity for rational numbers.

   A. 0

   B. 1

   C. -1

   D. 1/2

2. Which of the following rational numbers is equivalent to −2/5?
   A. −4/10
   B. −2/10
   C. −4/5
   D. −6/25

3. Which is the correct descending order of −2, 4/−5, −11/20, 3/4?
   A. 3/4 > −2 > −11/20 > 4/−5
   B. 3/4 > −11/20 > −4/5 > −2
   C. 3/4 > 4/−5 > −2 > −11/20
   D. 3/4 > 4/−5 > −11/20 > −2

4. The product of two numbers is -20/9. If one of the numbers is 4, find the other.
   A. -5/9
   B. 3/11
   C. 12/39
   D. -9/11

5. Write the rational number whose denominator is the smallest 2-digit number and the numerator is the greatest 3-digit number.

   A. 999/100
   B. 999/10
   C. 99
   D. 99/10

6. The numbers ……. and ………. are their own reciprocals.
   A. -1 and 0
   B. 1 and 0
   C. 1 and -1
   D. 1 and 2

7. What type of a number is −3/0?
   A. A positive rational number.
   B. A negative rational number.
   C. Either a positive or a negative rational number.
   D. Neither a positive nor a negative rational number.

8. Which is the equivalent of −143/21?
   A. −6 + 17/21
   B. 6 + (−17/21)
   C. (−6) + (−17/21)
   D. −6

9. If −4/7 = −32/x, what is the value of x?
   A. 56
   B. −56
   C. 46
   D. −46

10. What should be added to -5/11 to get 3/11?
   A. -1/4
   B. 8/11
   C. 1
   D. -3/4

11. –6/5 × 1 = _____.
   A. –6/5
   B. 6/5
   C. –5/6
   D. 5/6

12. (-3/5 x 0) +1= _____.
   A. 0
   B. 1
   C. 3/5
   D. 2

ANSWERS:

1. B	2. A	3. B	4. A	5. B
6. C	7.. D	8. C	9. A	10. B
11. A	12. B			

LEARNING OBJECTIVES:

	Use a ruler and compass and construct a line parallel to another line through a point not on the line
	List and execute steps and construct a triangle given the measures of its three sides.
Constructing a triangle when the lengths of two sides and measure of angle between the mare known (SAS)	List and execute steps and construct a triangle when any of its two lengths and an angle between them is given.
Construct triangle when measure of 2 angles and one side are known (ASA)	List and execute steps and construct a triangle when any of its two angles and the side included between them is given.
Construct a right-angled triangle when length of one leg and hypotenuse are known (RHS)	List and execute steps and construct a right-angled triangle when the length of one leg and its hypotenuse are given.
	Examine the given information and determine if construction of a triangle from it is possible or not.

LEARNING OUTCOME:

- Uses ruler and a pair of compasses in order to construct a line parallel to a given line from point outside the line and the triangles.

QUESTIONS:

1. **A triangle can be constructed by taking its sides as:**
    A. 1.8 cm, 2.6 cm, 4.4 cm
    B. 2 cm, 3 cm, 4 cm
    C. 2.4 cm, 2.4 cm, 6.4 cm
    D. 3.2 cm, 2.3 cm, 5.5 cm

2. **Which of the following sets of triangles could be the lengths of the sides of a right-angled triangle:**
        A. 3 cm, 4 cm, 6 cm
        B. 9 cm, 16 cm, 26 cm
        C. 1.5 cm, 3.6 cm, 3.9 cm
        D. 7 cm, 24 cm, 26 cm

3. **Which of these triangle can be constructed?**
        A. $\triangle ABC$, $\angle A = 85°$, $\angle B = 115°$, $AB = 5$ cm
        B. $\triangle PQR$, $\angle Q = 30°$, $\angle R = 60°$, $QR = 4.7$ cm
        C. $\triangle ABC$, $BC = 2$ cm, $AB = 4$ cm, $AC = 2$ cm
        D. $\triangle LMN$, $\angle L = 60°$, $\angle N = 120°$, $LM = 5$ cm.

4 **In which of the following cases, a unique triangle can be drawn:**
AB = 4 cm, BC = 8 cm and CA = 2 cm
        A. $BC = 5.2$ cm, $\angle B = 90°$ and $\angle C = 110°$
        B. $XY = 5$ cm, $\angle X = 45°$ and $\angle Y = 60°$
        C. An isosceles triangle with the length of each equal side 6.2 cm.

5. **How many medians a triangle can have?**
    A. 1
    B. 3
    C. 2
    D. 4

6. **$\triangle PQR$ is a triangle right-angled at P. If PQ = 3 cm and PR = 4 cm. Find QR.**
    A. 3 cm
    B. 7 cm
    C. 5 cm
    D. 8 cm

7. **Which among the following is used to construct a triangle?**
    A. The lengths of the three sides.
    B. The perimeter of the triangle.
    C. The measures of three angles.
    D. The names of three vertices.

8. **In the Pythagoras property, the triangle must be _____.**
    A. acute-angled
    B. obtuse-angled
    C. right-angled
    D. scalene

9. **PQR is a triangle right-angled at P. If PQ = 3 cm and PR = 4 cm. Find QR.**
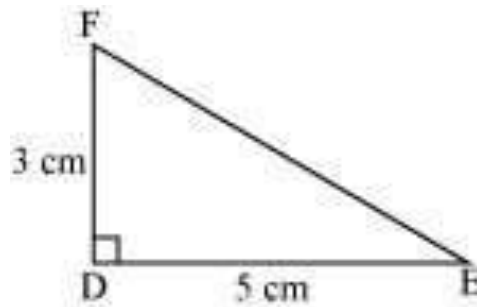   A. 3 cm
    B. 7 cm
    C. 5 cm
    D. 8 cm

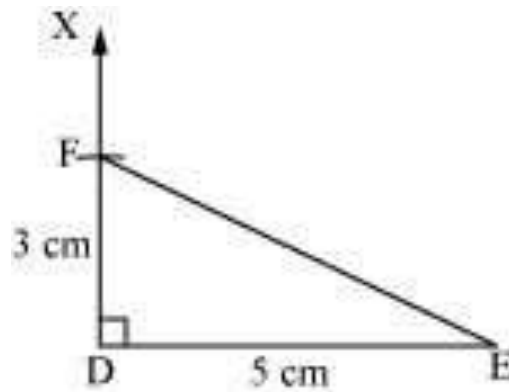**10. Which is the longest side in the triangle PQR right angled at P?**

    A. PR

    B. PQ

    C. QR

    D. QP

11. Construct ΔDEF such that DE = 5 cm, DF = 3 cm and m(∠EDF) = 90°.

A.

B.

C.
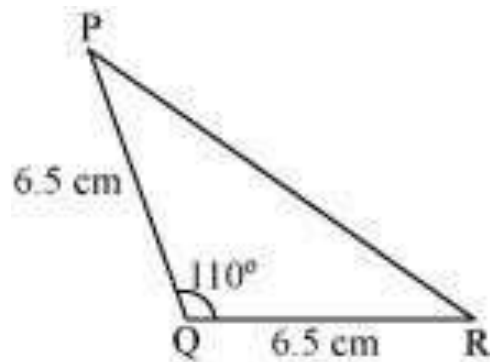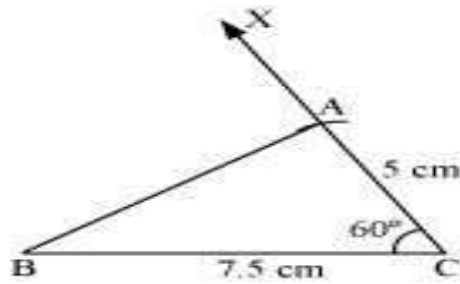

D.   none of these

12. Construct ΔABC with BC = 7.5 cm, AC = 5 cm and m(∠C) = 60°.
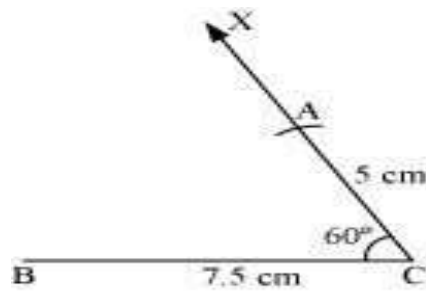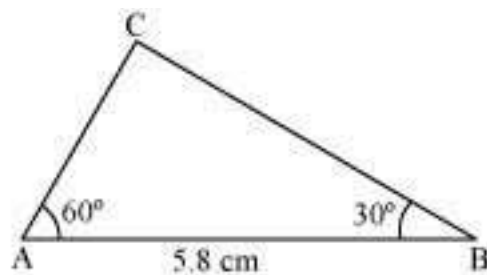
A.
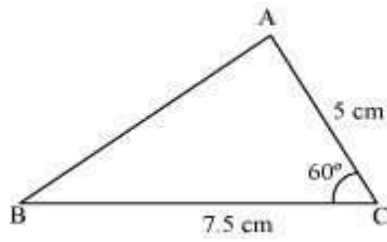
B.

C.

D.

ANSWERS:

1. A   2. C 3. B 4. A   5. B 6. C 7. A 8. C 9. C 10. C 11. B 12. B

CHAPTER: 11
TOPIC: Perimeter and area

LEARNING OBJECTIVES:

Concept of area and Perimeter	Describe the area and perimeter of plane figures and find the same for square and rectangle
	Give example(s) and explain that increase in perimeter of a plane figure does not always mean that area will also increase
	Use unit square grid sheets and determine the perimeter and area square and rectangles
Squares and Rectangles	Develop and apply a formula and determine the area of triangle as half of the area of a rectangle.
	Recall the concept of congruent figures and generalize the area of congruent parts of rectangles.
	Use unit square grid sheets and find the perimeter and estimate the area of parallelogram.
	Develop and apply a formula and determine the area of a parallelogram.
Area of triangle	Compare the area of a triangle and its corresponding parallelogram and discuss their relation.
Circles	Use direct or indirect measurements and describe the relationships among radius, diameter, and circumference of circles
	Investigate different circumference of circles and compare them with their respective diameter and relate circumference to Pi.
	Use direct or indirect methods to find the circumference of circle, semicircle.
	Develop and apply the formula and find the area of a circle and semicircle.
Conversion of units	Convert units and measure area or perimeter in other units.
Applications	Examine area and perimeter of different figures and find solution for real life problems.

- Uses unit square grid /graph sheet in order to approximate the area of a closed shape
- Applies properties of simple shape in order to calculate the areas ofthe regions enclosed in a rectangle and a square

QUESTIONS:

1. The area of a rectangular field of length 20m and breadth 15m is _____.

A. 200

B. 250

C. 300

D. 350

2. The perimeter of a square of side 25m is _____.

A. 75m

B. 100m

C. 125 m

D. 90

3. The area of a triangle whose base is 7 cm and height 4 cm is_____.

A. 28 sq cm

B. 14 sq cm

C. 22 sq cm

D. None

4. If the area of the parallelogram is 32 sq cm and the base is 4 cm, then height is __.

A. 128 cm

B. 8 cm

C. 64 cm

D. 32 cm

5. Find the breadth of a rectangular plot of land, if its area is 440 m2 and the length is 22 m. Also find its perimeter.

A. $84m^2$

B. $64m^2$

C. $24m^2$

D. $44m^2$

6. ΔABC is right angled at A (see the given figure). AD is perpendicular to BC. If AB = 5 cm, BC = 13 cm and AC = 12 cm, Find the area of ΔABC. Also find the length of AD.
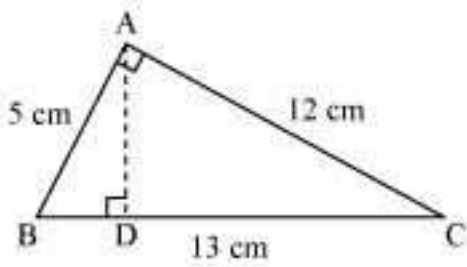
A. 5.6m

B. 4.6m

C. 2.6m

D. 6m

7. The circumference of a circle with radius 14 cm is_____.

A. 88 cm

B. 44 cm

C. 22 cm

D. 28 cm

8. The area of a rectangular room is 150 m2. If its breadth is 10 m, then find its length.

A. 15 m

B. 25 m

C. 50 m

D. 55 m

9. If the circumference of a circular sheet is 154m, then radius equal to ____.

A. 24.5m

B. 2.45m

C. 34.5m

D. 49.5m

10. From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet. (Takeπ = 3.14)
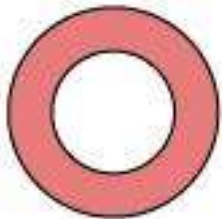
A. 22cm^2

B. 21cm^2

C. 21.98cm^2

D. 2.98cm^2

Answers:

1. C   2. B 3. B   4. B   5. A   6. B   7. A   8. A   9. A   10.. C

CHAPTER: 12
TOPIC: Algebraic expressions

LEARNING OBJECTIVES:

Difference between algebraic expressions and arithmetic expressions	Describe algebraic expressions and distinguish them from arithmetic expressions.
Formation of expressions	Combine variables and constants in order to form an algebraic expression for the given statement.
Terms of an expression	Examine the given algebraic expression and determine its terms and their factors
	Examine the given algebraic expressions and distinguish between the terms which are constants and those which are not.
	Examine the given algebraic expression and determine the numerical coefficient of the given variable.
Like and unlike Terms	Examine the algebraic factors of the given terms and distinguish between like and unlike terms.
Monomials, binomials, trinomials and polynomials	Examine the given algebraic expressions and classify them as monomial, binomial, trinomial, polynomial.
Add and subtract algebraic expressions	Combine like terms and simplify the given algebraic expression.
	Add algebraic expressions and determine their sum.
	Subtract the given algebraic expressions and determine their difference.
Finding value of an expression	Use the given value of variable(s) and evaluate the algebraic expression.
Using algebraic formulas and rules	Use the given algebraic expression and complete the table of number patterns or find its nth term.
	Examine the pattern and verify whether the given algebraic expression satisfies the shown pattern or not.

LEARNING OUTCOME:

- Translates a real-life situation in the form of a simple algebraic equation in order to arrive at a generalized problem and solution for the situation
- Applies algebraic properties in order to add /subtract two algebraic expressions

QUESTIONS:

1. What is the coefficient of x^2 in the expression $2x-4x^2$

    A. -4

    B. 1

    C. -x

    D. 2

2. Find the product of $(2x+3y)$ $(2x+3y)$.

    A. $4x^2+9y^2+13xy$

    B. $4x^2+7y^2+12xy$

    C. $4x^2+9y^2+12xy$

    D. $5x^2+9y^2+12xy$

3. Simplify: $p + (p - q) + q + (q - p)$

    A. p

    B. q

    C. p + q

    D. p – q

4. Find the value of the expression $x + 2$ for $x = -2$.

    A. 0

    B. 2

    C. -2

    D. 4

5. **Simplify combining like terms: $3a - 2b - ab - (a - b + ab) + 3ab + b - a$**

A. a - ab

B. a + ab

C. a + b

D. b - a

6. **Subtract $-xy$ from xy**

A. xy

B. 2xy

C. 3xy

D. 4xy

7. **What degree does $x^3 - x^2y^2 - 8y^2 + 2$ have?**

A. 2

B. 3

C. 4

D. 7

8. **What the statement for the expression $3mn + 5$**

A. number 5 added to the product of m and n

B. number 5 added to one third the product of m and n

C. number 5 added to 3 times the product of m and n

D. number 5 added to 5 times the product of m and n

Answers:

1. A	2. C	3. C	4. A
5. B	6. B	7. C	8. C

CHAPTER: 13
TOPIC : Exponents and powers
LEARNING OBJECTIVES :

Exponents	Describe exponential form of numbers and express numbers in exponential notation.
	Examine the exponential form of the given number and identify its base and exponent.
	Examine the numbers given in exponential form and compare and represent them in an order.
	Find prime factors of numbers and express them as the product of powers of prime factors
Laws of Exponents	Apply laws of exponents and simplify a given expression
	Write numbers using powers of 10 and express them in standard form
Decimal Number System	Expand the given number using powers of 10 and express it in the exponent form.
Expressing large numbers in standard form	Represent large numbers in exponential form and read, understand and compare them easily.

LEARNING OUTCOME:
• Applies properties of exponential numbers in order to simplify problems involving multiplication and division of large numbers.

QUESTIONS:
1. **The exponential form of 10000 is**
    A. 10^3
    B. 10^4
    C. 10^5
    D. 10^2

2. $\{(3/4)^{-1}-(1/4)^{-1}\}^{-1} = ?$
    A. 3/8
    B. −3/8
    C. 8/3
    D. −8/3

3. Simplify and write in exponential form of $2^2 \times 2^5$.

    A. 2^7

    B. 2^5

    C. 2^8

    D. 2^4

4. The number which is multiplied by $(-8)^{-1}$ to obtain a product equal to 10^{-1} is ___.

    A. $-4/5$

    B. $-3/5$

    C. $-1/5$

    D. $-5/4$

5. The value of $(23/25)^0 \times (-1/2)^5 \times 2^3 \times (3/4)^2$ is

    A. $-9/64$

    B. $9/64$

    C. $64/9$

    D. $-64/9$

6. The value of $(-1)^{75}$ is ___.

    A. 0

    B. 1

    C. -1

    D. 75

7. Express 2048 as a power 2.

    A. 2^8

    B. 2^{11}

    C. 2^{10}

    D. 2^9

ANSWERS:

1) B   2) B   3) A   4) A   5) A   6) C   7) B

CHAPTER: 14
TOPIC: Visualizing solid shapes

LEARNING OBJECTIVES:

Introduction to Plane figures and solid shapes	Discuss and give examples and differentiate between plane figures and solid shapes
Faces, edges and vertices	Examine different solid shapes and identify and count their number of faces, edges and vertices
Nets for building 3D shapes	Build nets of 3D shapes and understand their properties
Drawing solids on a flat surface	Examine oblique sketches and visualize all the faces of a solid shape
	Use isometric dot sheet and draw isometric sketches of a 3D shape.
	Draw 3D objects in 2D and visualize solid objects from different perspectives.
Viewing different sections of a solid	Examine cross sections of different solid shapes and interpret and visualize different planes.
	Examine the different figures formed by changing the angle of shadows formed and visualize solid figures
	Examine solid figures from different angles and view different sections of solids.

QUESTIONS:

1. Two cubes of edge length 2 cm are placed side by side. The length of the resulting cuboid is _____.

    A. 2 cm

    B. 4 cm

    C. 1 cm

    D. 3 cm

2. What cross-section do you get when you give a horizontal cut to a die?

    A. Square

    B. Rectangle

    C. Triangle

    D. Circle

3. Which of the following alphabets has many lines of symmetry?
   A. I
   B. O
   C. P
   D. F

4. What cross-section do you get when you give a horizontal cut to a brick?
   A. Triangle
   B. Circle
   C. Square
   D. Rectangle

5. What cross-section do you get when you give a vertical cut to a round apple?
   A. Circle
   B. Triangle
   C. Square
   D. Rectangle

6. State the number of lines of symmetry for a rectangle.
   A. 5
   B. 2
   C. 3
   D. 4

7. What cross-section do you get when you give a vertical cut to an ice-cream cone?
   A. Triangle
   B. Circle
   C. Rectangle
   D. Square

8. The shadow of the lamp of a cube when seen under overhead projector is
   A. Square
   B. Circle
   C. Triangle
   D. Rectangle

ANSWERS:

1. B	2. A	3. B	4. D
5. A	6.. B	7. A	8. A

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"Live as if you were to die tomorrow. Learn as if you were to live forever"

- Mahatma Gandhi

2021