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Syllabus
Academic Session 2016-2017

APRIL-MAY:

1. Integers:
   • Multiplication and division of integers
   • Properties of integers (including identities for addition & multiplication - commutative, associative and distributive)
   • Word problems including integers (all operations)

2. Lines and Angles:
   • Pairs of angles (linear pair, supplementary, complementary, adjacent and vertically opposite angles)
   • Properties of parallel lines with transversal (alternate, corresponding, interior and exterior angles)

JULY:

3. Rational Numbers:
   • Introduction to rational numbers
   • Operations on rational numbers
   • Word problems (including all operations)

4. Data Handling:
   • Collection and organization of data
   • Mean, median and mode of ungrouped data
   • Introduction to Probability
   • Drawing bar graphs

AUGUST:

5. Exponents and Powers:
   • Introduction to exponents
   • Zero exponent
   • Laws of exponents (through patterns)

6. Perimeter and Area:
   • Area of a square, rectangle, parallelogram and triangle
   • Area between two rectangles
   • Idea of \( \pi \)
   • Circumference and area of circle
   • Area between two concentric circles

REVISION FOR FIRST TERM EXAMS
SEPTEMBER-OCTOBER:

7. Symmetry:
   - Recalling reflection symmetry
   - Rotational symmetry – observations of rotational symmetry of 2D objects (90°, 120°, 180°)
   - Rotating given figure about a given point by 90° and 180°

NOVEMBER:

8. Algebraic Expressions:
   - Identifying constants, coefficients and powers
   - Like and unlike terms, degree of expressions
   - Addition and subtraction of algebraic expressions.
   - Evaluation of algebraic expressions.

9. The Triangle and its Properties:
   - Angle sum property
   - Exterior angle property
   - Triangle inequality property
   - Pythagoras Theorem

DECEMBER:

10. Simple Equations:
    - Solving linear equations in one variable
    - Word problems

JANUARY-FEBRUARY:

11. Practical Geometry:
    - Construction of simple triangles (given three sides, given a side and two angles on it, given two sides and the included angle, given a side and the hypotenuse of a right angle)

12. Congruence of Triangles:
    - Introduction to the concept of congruence of figures
    - Conditions of congruence of triangles (SAS, SSS, ASA and RHS)

13. Comparing Quantities:
    - Understanding percentage as a fraction with denominator 100
    - Converting fractions and decimals into percentage and vice-versa
    - Application to profit and loss
    - Application to simple interest

REVISION FOR ANNUAL EXAMS
Assignments
Assignment – 1
INTEGERS

1. (a) What should be subtracted from \((-18 -19 -13)\) to obtain \((-15 + 28 - 9)\)?
(b) The product of two integers is \(-105\). If one of them is 7, find the other.
(c) Write a pair of integers whose difference gives \(-6\).
(d) What is the difference between the temperature 15 degrees above zero and 20 degrees below zero?
(e) Solve \(-|-12| + |-3| - 5\).

2. Which of the following statements is true and which is false? Justify each false statement with an example/reason.
(a) The collection of integers is closed under division.
(b) The product of four positive integers is positive.
(c) The product of four negative integers is negative.
(d) \(24 + 3(2)\) is same as \(24 + 3 \times 2\).
(e) \((-1)^{25} = 1\)

3. Simplify each of the given expressions:
   (a) \(25 - \left[-15 - \left(23 - 4\text{of}7 + 10\right)\right]\)
   (b) \(17 + \left[18 + 3\left(-2 - 4\right) + 1\right]\)
   (c) \(-125 + 250 + 5 \times 10 - 325\)
   (d) \((5 - 2 \times 3) - \left[-2 - \left\{10 + (3 + 10 + 2)\right\}\right]\)

4. Simplify each of the following using a suitable property:
   (a) \(15 \times 93 + 15 \times (-73)\)
   (b) \(80 \times 665 \times (-125)\)
   (c) \(-124 \times 25 - 25 \times (-24)\)
   (d) \((-42) \times (-98)\)
   (e) \(56 \times (-23) - 56 \times 76 - 56\)

5. A boy flung a pebble 18 metres high in the air which fell and settled at the bottom of a pond 14 metres deep. By how much distance did the pebble fall?

6. A certain freezing process requires that room temperature be lowered from 45°C at a rate of 6°C every hour. What will be the room temperature 8 hrs after the process begins?

7. Every floor of a 20 storey building is 5 m high. If a lift moves 2 metres every second, how long will it take to move from 3rd floor to the 15th floor?

8. In a test (+4) marks are given for every correct answer and (-2) marks for every wrong answer. Rohit answered 25 questions correctly and scored 68 marks. How many questions did he attempt incorrectly?

9. Poonam is an enthusiastic student in her diving class. On the first day, she managed to dive to a depth of 5m. From second day onwards, she managed to dive five meters deeper than the previous day, and so on. How far did she dive on the fifth day?

10. A manufacturer is producing two products A and B. He earns a profit of Rs 36 per unit on product A and a loss of Rs 8 per unit on product B. If he sells 3000 units of product A and 2500 units of product B, find his overall profit or loss.

WEB RESOURCES:
Multiplication of integers: http://goo.gl/LJW8MM
**Enrichment Exercise [Optional]:**

1. Fill in the missing positive/negative signs to make each statement true:
   (a) \( \_15 + \_30 = -15 \)
   (b) \( \_42 - \_9 \times \_10 + \_9 = -123 \)
   (c) \( \_81 + \_9 + \_4 = -13 \)

2. In each case, give two negative integers and one positive integer such that
   (a) their sum is \(-12\)
   (b) their product is \(500\)

3. If \( a = -2 \) and \( b = 3 \), then find the value of \( |a-b| - a \times b \).

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**Fun Corner**

Students must complete each of the questions and then colour in the given pattern corresponding to their answers.

**Multiplying Integers**

(2)(3)=

(-4)(3)=

(-5)(0)=

(1)(-1)

(-5)(-1)=

(5)(-2)=

(3)(4)
Assignment – 2

LINES and ANGLES

1. Find the values of $x$, $y$ and $z$:

\[
\begin{align*}
20^\circ & = 3x^\circ \\
4y^\circ & = 84^\circ \\
75^\circ & = 2x^\circ \\
\end{align*}
\]

2. Fill in the blanks (show the working wherever required):

(a) A pair of supplementary angles form a ________ when placed adjacent to each other.

(b) The supplement of an ________ is an acute angle.

(c) The complement of half of $120^\circ$ is ________.

(d) If $2x - 3$ and $3x + 8$ form a linear pair, then the value of $x = \square$.

(e) If $7x$ is the complement of $2x - 9$, then the value of $3x = \square$.

(f) If an angle is less than $60^\circ$, its complement will be greater than ______.

(g) If co-interior angles are not supplementary, the lines are ________.

(h) $\angle 1$ and $\angle 2$ are complementary angles, $\angle 2$ and $\angle 3$ are supplementary angles. If $\angle 1 = 45^\circ$ then, $\angle 2 = \square$ and $\angle 3 = \square$.

3. The difference between two complementary angles is $44^\circ$. Find them.

4. Two angles forming a linear pair are in the ratio $17 : 19$. Find their difference.

5. Find the value of $x$ if $l$ is parallel to $m$.

6. State true or false. Justify each false statement with an example/reason.

(a) Two angles forming a linear pair are supplementary.

(b) Two supplementary angles form a linear pair.

(c) If two lines are intersected by a transversal, then pairs of corresponding angles are equal.

(d) If a transversal cuts two lines such that the co-interior angles are supplementary, then the lines are parallel.
7. Find the value of $x$ if AB is parallel to CD.

8. Line AB intersects line CD at O. If $\angle AOC$ is twice of $\angle AOD$, find the measure of all the angles. Draw the required figure.

9. If the transversal $l$ is perpendicular to line $a$ as well as line $b$, is $a \parallel b$? Construct a diagram to illustrate your answer.

10. When twice an angle is added to $45^\circ$, you get the supplement of the angle. Find the angle.

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**Enrichment Exercise**

A. Find the value of the unknowns:
B. Look at the given figure and answer the following questions:

1. Name a pair of adjacent angles……………
2. Name a pair of complementary angles………………….
3. Name a pair of supplementary angles……………
4. Name a linear pair of angles……………………
5. Number of obtuse angled triangles……………
6. Name an acute angled triangle…………………
7. NE || …………………
8. Angle NOE =………………..(vertical angle)
9. Measure of angle ONE……………………
10. Measure of angle POC………………….
Assignment – 3
RATIONAL NUMBERS

1. Fill in the blanks (show the required working):

(a) The additive inverse of \( \left( \frac{-8}{9} + \frac{7}{3} \right) \) is \( \text{________} \).

(b) The standard form of \( \frac{65}{-117} \) is \( \text{________} \).

(c) If \( \frac{-18}{72} = \frac{x}{16} \), then \( x = \text{________} \).

2. State True or False:

(a) \( \frac{-4}{-7} \) is a rational number.

(b) \( \frac{-3}{8} \) is a fraction.

(c) \( \frac{3}{-5} \) is not a rational number.

(d) \( \frac{-7}{-8} \) is a positive rational number.

(e) 106 is a positive rational number.

(f) \( \frac{16}{0} \) is a rational number.

3. Arrange in ascending order: \( \frac{2}{3}, \frac{-14}{-9}, \frac{-5}{6}, \frac{7}{12} \).

4. \( \frac{-11}{24} \) when subtracted from a number gives \( \frac{23}{72} \). Find the number.

5. What should be added to the sum of \( \frac{-5}{7} \) and \( \frac{3}{14} \) to get \(-1\)?

6. (a) By what number should we multiply \( \frac{-17}{45} \) so that the product may be \( \frac{-17}{5} \)?

(b) A number when divided by \( \frac{-18}{55} \) gives the result \( \frac{-22}{9} \). Find the number.

7. The teacher asked the students to read as much as possible of a particular book during the weekend. Rohit read \( \frac{1}{2} \) of the book, Angela read \( \frac{5}{6} \) of the book and Sumit read \( \frac{2}{3} \) of the book. Arrange the three names in the order from the one who read most to the least.

8. Sarita had \( 87 \frac{1}{2} \) m of ribbon for sale. She cut them into pieces of \( 6 \frac{1}{4} \) m each for streamers to decorate the school hall for Christmas. How many pieces did she get? Was there any left?


10. In a theatre \( \frac{1}{2} \) the audience were women and \( \frac{1}{3} \) of these women were school girls. If the total audience were 600 in number, how many were school girls?

WEB RESOURCES:
Division by zero undefined: http://goo.gl/aDmGcj
Enrichment Exercise [Optional]:

1. In each case, find a positive and a negative rational number whose
   (a) Sum is \( \frac{7}{15} \)
   (b) Product is \(-7\frac{1}{8}\)
   (c) Difference is \(-\frac{8}{21}\)

2. Find \( x \) in each case:
   (a) \( \frac{-3}{7} + x = \frac{8}{3} \)
   (b) \( \frac{-12}{5} - x = \frac{5}{9} \)
   (c) \( x + \frac{5}{12} = \frac{18}{25} \)
   (d) \( \frac{5}{12} + x = \frac{18}{25} \)

Fun Corner

PUZZLE on Rational Numbers

\[
\begin{array}{ccc}
\frac{1}{5} \times \frac{6}{3} + \frac{9}{7} = \frac{9}{14} \\
\times \frac{\frac{6}{7}}{x} = \frac{9}{14} \\
\frac{-5}{6} - \frac{x}{\frac{-1}{4}} = \frac{-1}{4} \\
\frac{6}{\frac{1}{14}} = \frac{7}{9} + \frac{-1}{9}
\end{array}
\]
Assignment – 4
DATA HANDLING

1. Find the median and the mode of the given data: 29, 23, 31, 28, 31, 18, 20, 27, 23, 31
2. Find the daily maximum and minimum temperature of 1st week of July. Display the data by constructing a double bar graph.
3. Go to each section of class VII and note down the number of girls and boys in each section. Construct a double bar graph for this data.
4. Following are the marks scored (out of 50) by a student in Unit tests:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>48</td>
</tr>
<tr>
<td>Hindi</td>
<td>36</td>
</tr>
<tr>
<td>Maths</td>
<td>49</td>
</tr>
<tr>
<td>Social studies</td>
<td>27</td>
</tr>
<tr>
<td>Science</td>
<td>50</td>
</tr>
<tr>
<td>Third language</td>
<td>15</td>
</tr>
</tbody>
</table>

Construct a bar graph for the above data (taking Scale of 5).
5. There are eight people traveling in a lift. Their weights are given in the table below.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 kg</td>
<td>53 kg</td>
<td>70 kg</td>
<td>64 kg</td>
<td>72 kg</td>
<td>59 kg</td>
<td>71 kg</td>
<td>58 kg</td>
</tr>
</tbody>
</table>

(a) If the lift can carry a weight of only up to 600 kg, are these people within the capacity of the lift?
(b) Find the mean of the given data.
6. The letters of the word “PROBABILITY” are placed in a bag and one letter is taken out.
   (i) There are ______ outcomes?
   (ii) What is the probability of the following being the one taken out?
   (a) P(P) = _____
   (b) P(B) = _____
   (c) P(vowels) = _____
   (d) P(consonants) = _____
   (e) P(X) = _____
   (f) P(any letter) = _____
7. Write all the possible outcomes of picking a number from the first 10 composite numbers. Find the range of this list. What is the probability of getting an even number?
8. Write all the integers between –4 and 11. What is the median of this list? Also, find the probability of picking an odd number from this list.
9. An ordinary pack of 52 cards is well shuffled. The top card is then turned over. What is the probability that (a) the top card is a red card. (b) the top card is a numbered card.
10. What is the probability of:
    (a) getting an ace from a deck of 52 cards?
    (b) getting a number less than 7 when a die is rolled?
    (c) a card of spades from a deck of 52 cards?
    (d) getting at least one heads when two coins are tossed together?
    (e) getting a prime number when a die is rolled?

WEB RESOURCES:
Introduction to Probability https://goo.gl/SwOU0H
Enrichment Exercise [Optional]:

1. 25 years ago, when my parents got married, their average age was 27 years. Now, the average age of my family, consisting of myself and my parents is 42 years. How old am I?

2. The average attendance of a class from Monday to Wednesday was 39 and that from Wednesday to Saturday was 39.5. What was the attendance on Wednesday, if the average Attendance from Monday to Saturday was 40?

3. The mean, median and mode of four numbers is 8. The smallest number is 7. Find the numbers.

Fun Corner

Directions: Color in the marbles in each jar to make the sentences true if you closed your eyes and picked a marble out of the jar.

I am more likely to pick a red marble and less likely to pick a green marble.

I am more likely to pick a blue marble and less likely to pick a yellow marble.

I am more likely to pick a blue marble and less likely to pick a green marble.
Assignment – 5

EXPONENTS AND POWERS

1. a) Is the value of \((-3)^5\) and \(-3^5\) same? Give reason.
   
b) Is the value of \((-3)^6\) and \(-3^6\) same? Give reason.

2. Write 2187 in its exponential form.

3. Find the value of \(2^9 \times 2^{91} - 2^{19} \times 2^{81}\).

4. Find the value of \(2^3 + 2^2 + 2^0\).

5. Simplify the following using laws of exponents:
   
   \[ \begin{align*}
   \text{a)} & \quad 125^5 + 125 \times 5^8 \\
   \text{b)} & \quad \left(\frac{2}{3}\right)^7 \times \left(\frac{2}{3} \right)^5 \times \left(\frac{2}{3} \right)^{0.5} \\
   \text{c)} & \quad \left(\frac{4}{7} \right)^5 \times \left(\frac{4}{9} \right)^4 \\
   \text{d)} & \quad 5^a \times 25^b
   \end{align*} \]

6. Find \(x^2\) if \(x = (-9)^2 + \left[(-9)^{-2}\right]^0\).

7. Using laws of exponents, determine \(x\) so that:
   
   \[ \begin{align*}
   \text{a)} & \quad \left(\frac{3}{5}\right)^3 \times \left(\frac{3}{5}\right)^{x+5} = \left(\frac{3}{5}\right)^{14} \\
   \text{b)} & \quad (2^x)^6 = (2^9)^2 \\
   \text{c)} & \quad \left(\frac{2}{3}\right)^{2x^4} = \left(\frac{2}{3}\right)^{3x+1} \\
   \text{d)} & \quad 7^{2x-1} \times 7^3 = 49 \\
   \text{e)} & \quad 6^{x-1} = 1 \\
   \text{f)} & \quad x^3 \times (-5)^3 = (-10)^3
   \end{align*} \]

8. Simplify using laws of exponents:
   
   \[ \begin{align*}
   \text{(a)} & \quad \frac{(2^3)^3 \times 3^3 \times 5^4}{8^2 \times 3^2 \times 125} \\
   \text{(b)} & \quad \left[729^3 + 729\right] + 3^8
   \end{align*} \]

9. If \(4^x = 256\), then find the value of \(6^{2x-8}\).

10. Find the value of \(\left(-2\right)^{2.5}\).

WEB RESOURCES:

Exponents and Powers

http://goo.gl/voUSkE
Assignment – 6
PERIMETER AND AREA

1. Find the area of the parallelogram ABCD if DX \perp AB, BY \perp AD, BY = 30 \text{ cm}, DX = 20 \text{ cm} and AD = 25 \text{ cm}. Also find the length of AB.

2. The area of a parallelogram ABCD is equal to that of another parallelogram PQRS. In ABCD, AB = 40 \text{ cm} and the corresponding altitude DE = 18 \text{ cm} whereas in PQRS, QR = 36 \text{ cm}. Find the corresponding altitude PM.

3. \Delta PQR is right angled at P. PS is perpendicular to QR. If PQ = 8 \text{ cm}, QR =17 \text{ cm} and PR = 15 \text{ cm}, find the area of \Delta PQR. Also find the length of PS.

4. A garden in the form of a right angled triangle has an area of 72 \text{ sq m}. If the two sides comprising the right angle are equal, what could be the length of these sides?

5. The area of a parallelogram is 420 \text{ sq m}. If the distance between two parallel sides is 15 \text{ m}, find the length of these sides.

6. If the perimeter of a parallelogram is 140 \text{ m}, the distance between a pair of opposite sides is 7 \text{ m} and its area is 210 \text{ sq m}, find the length of two adjacent sides of the parallelogram.

7. To fence a circular garden, the total cost is Rs 26,400 at the cost of Rs 50 per metre. Find the radius of the circle.

8. A tablecloth 350 \text{ cm} long and 200 \text{ cm} wide has a 15 \text{ cm} border all around it inside. Find the cost of printing the border at the rate of 50 paise per 10 \text{ sq cm}.

9. A rectangular garden is 200\text{ m} long and 160\text{ m} broad. In its middle, there is a circular tank of radius 28\text{ m}. Find the cost of covering the remaining portion of the garden with grass at the rate of 50 paise per \text{ sq metre}. (Take \pi = \frac{22}{7})

10. If the length of the minute hand of a clock is 14\text{ cm}, find
(a) The distance covered by its tip in one hour.
(b) The area swept by it in half an hour.

11. There are two concentric circles. The radius of the outer circle is 10 \text{ cm} & the radius of the inner circle is 4 \text{ cm}. Find the area of the shaded portion. (Take \pi = \frac{22}{7})

WEB RESOURCES:
CIRCLE & PI: http://goo.gl/8ORvZy
AREA OF CIRCLE: http://goo.gl/WZL8Is
Enrichment Question [Optional]:
Q. If a square paper is folded into half, the new rectangle has a perimeter of 39 inches. What is the area of the original square? Also, find its perimeter.

Fun Corner

Balancing Act:
Scales 1 and 2 are in perfect balance. How many X’s must be put on the right side of Scale 3 to maintain the balance?

* Egg & Box- answer: 850 paise (A pair of egg and box costs 250 paise)
* Number of triangles - answer: 48
1. Write the numerical coefficients of all the terms in the following expression:
   (a) \(-pq + 7p^2q^2\)  
   (b) \(x + 3xy - 4yz\)

2. Fill in the blanks:
   (a) The coefficient of \(x^2\) in \(-7x^3 + 4x^2 - 10x\) is \(\ldots\).
   (b) The terms of the expression \(-15x^3 - 4y^3 + 10x^3y^3\) are \(\ldots\), \(\ldots\) and \(\ldots\).
   (c) The degree of the expression \(-3x^3y + 2^2xy^2 - x^2y^2\) is \(\ldots\).
   (d) If \(3x = -18\), then \(5x = \ldots\).
   (e) The coefficient of \(a^2\) in \(-21a^2b^3c\) is \(\ldots\).
   (f) \(-2a^2xy\) and \(3xa^2y\) are unlike terms. True/False: \(\ldots\).

3. Simplify:
   (a) \(-18x^3 + 21x^3 - 35y^3\)
   (b) \(a^2b - 5b^3 - 4ba^2 + 11b^3 - 20b^3\)
   (c) \(-4x^2y^3 + x^3y^2 - 5x^3y^2 + 7x^2y^3\)

4. What will be the value of \(a\) if \(3x^2 + x + a\) equal to 8 when \(x = 1\)?

5. What should be added to \(3x - y + 5z^2 - 4\) to get \(19y - 6 - 8x\)?

6. Subtract the sum of \(-7m^2 + 8n^2 - 3\) and \(4n^2 - 7\) from the sum of \(15m^2 + 11 - 6n^2\) and \(-10 - m^2 - n^2\).

7. If \(A = 2m - 5n - 7p\), \(B = -9n + 6m + 10p\) and \(C = 17p - 4n + 4m\), show that \(A - B + C = 0\).

8. For \(x = -1, y = 2\) and \(z = -3\), evaluate each of the following:
   (a) \(xy + z - y^2\)
   (b) \(2x^2 - 5y^2\)
   (c) \(-xyz + 8\)
   (d) \(\frac{y}{2} + \frac{z}{3}\)

9. If \(P = 4a - 3b - c^2\), \(Q = 2c^2 - 5a + 7b\) and \(R = 6b + c^2\), find
   (a) \(P - R\)
   (b) \(-R + Q\)

10. Rohan had \(17x^2 + 4x - 3\) rupees with him. He spent \(8x^2 - 7x - 9\) rupees for his birthday party. How much money is left with him?

11. Three sides of a triangle are \(2x^2 + 3x + 1, x^2 + 7\), and \(3x^2 - 2x + 3\). What is its perimeter?
Fun Corner

Combine the two like terms next to each other and write the simplified expression in the yellow triangle directly above the two terms...

race to the top!
containing like terms edition

directions: combine the two like terms next to each other. write the simplified expression in the yellow triangle directly above the two terms you combined. the first two have been done for you.

x -10x
3x -2x -8x 6x 10x -9x 13x x -12x
Assignment – 8
TRIANGLES AND ITS PROPERTIES

1. The angle at the vertex of an isosceles triangle is four times its base angles. Find the angles of the triangle.

2. An exterior angle of a triangle is 100° and one of its interior opposite angles is 3 times the other. Find the measure of each angle of the triangle.

3. One of the angles of an isosceles triangle is 100°. Is this a base angle or a vertical angle? Give reasons. Calculate the other two angles also.

4. A 13m long ladder is placed against the wall in such a way that the foot of the ladder is 5m away from the wall. At what height does the ladder reach the wall?

5. How much shorter is it to walk diagonally across a rectangular lawn ABCD whose length is 16m and breadth is 12m, than to walk along the sides to go from A to C?

6. Two poles are on the either sides of the road. Heights of the poles are 10m and 18m respectively. The distance between their tops is 17m. Find the width of the road.

7. In the given figure, find \( \angle ACD \) and \( \angle AED \) if \( \angle B = 45° \), \( \angle D = 40° \) and \( \angle A = 25° \).

8. Will sides 3cm, 5cm, 7cm form a triangle? Justify your answer.

9. Will sides 3cm, 5cm, 7cm form a right triangle? Justify your answer.

10. In \( \triangle PQR \), PQ = PR and \( \angle R = 40° \). Find the other two angles. Draw the required figure.

WEB RESOURCES:
Properties of Triangles
http://goo.gl/7n2UMq

Enrichment Exercise (Optional):
1) A 25m long ladder is placed against a vertical wall inside a room such that the foot of the ladder is 7m from the foot of the wall. If the top of the ladder slides 4m downwards, then the foot of the ladder will slide by
(a) 16m (b) 8m (c) 4m (d) 2m
2) Equal sides of an isosceles triangle are 13cm each and base 10cm. Find the altitude from the vertex to the base of the triangle.

3) In the given figure, BD = AD = AC and ∠EAC = 75°. Find the value of $x$.

Fun Corner

Egg & Box:

Find the number of triangles in the given figure:
Assignment – 9
SIMPLE EQUATIONS

Part- I
1. Solve the following linear equations:
   a) \(2(x-2) + 3(x-3) = 4(x-5) + (2x-1)\)
   b) \(\frac{3x}{2} + \frac{1}{10} = \frac{5x}{3} + \frac{1}{15}\)
   c) \(\frac{2x-5}{3} = \frac{x-3}{2}\)
   d) \(3.45x - 0.75 = 2.25 + 0.45x\)
   e) \(\frac{2x - 3x}{3} = 1 - 4x\)
   f) \(\frac{4 - 3x}{2} = \frac{2x + 29}{5}\)
   g) \(2(x+3) - 3x = 8 - 2(2x-5)\)

2. If \(\frac{5m-2}{2} = -11\), find the value of \(2m + 3\).

Part- II
1. Three-fourths of a number is more than half of the number by 6. Find the number.
2. The sum of three consecutive multiples of 6 is 108. Find the numbers.
3. Five times a number taken away from 100 is ten more than that number. Find the number.
4. Two angles are supplementary. One is \(64^\circ\) more than the other. Find the angles.
5. The length of a rectangular field exceeds its breadth by 10m. If the perimeter of the field is 100m, find the length and breadth of the field.
6. A man left two-thirds of his property to his wife, one-fourth to his daughter and \(RS\) 15000 to his son. How much money did the man have?
7. Ram’s age is 4 times that of his son. Five years ago, he was 9 times as old as his son was then. What are their present ages?
8. One-third of the length of a pole is under the ground, one-fourth in water and the remaining 5 m above water. Find the total length of the pole.
9. Aleeka is now 12 years old and Ravina is 24 years old. How many years ago was Ravina three times as old as Aleeka?
10. Each of the two equal sides of an isosceles triangle is three times as large as the third side. If the perimeter of the triangle is 28cm, find each side of the triangle.
11. The sum of two numbers is 94. The larger number is 5 less than twice the smaller number. Find the numbers.

12. Find the value of $x$ if the two triangles given below have the same perimeter.

WEB RESOURCES:
Simple Equations  
http://goo.gl/7JMM5a

Fun Corner

1. The diagram below shows a cross-shaped box containing three numbered blocks.

The puzzle is to slide the blocks around the box until the numbers read 1, 2, 3 as you go down. How do you do it?

2. Points A, B, C and D are arranged in order on a line such that $AB = 3BC = 2CD$. What is BD as a fraction of AD?
Assignment – 10
PRACTICAL GEOMETRY

1. Construct ΔABC in which AB = 6.5cm and BC = CA = 4.5cm.
2. Construct ΔABC in which AB = 6cm, BC = 5cm and ∠B = 45°.
3. Construct ΔPQR in which PQ = 5.4cm, ∠P = 70° and ∠Q = 80°.
4. Construct ΔPQR in which PQ = 6.3cm, ∠P = 70° and ∠R = 80°.
5. Construct ΔXYZ in which XY = 5cm, XZ = 7cm and ∠Y = 90°.
6. Construct ΔDEF with DE = 5cm, EF = 6.5cm and ∠E = 90°.
7. Construct an equilateral triangle of side 5.2cm.
8. Construct a right – angled triangle in which sides containing the right angles are 6cm and 4.5 cm. Measure the hypotenuse.
9. Construct an isosceles right-angled triangle ABC such that its hypotenuse AC=5.5cm.
10. In each case, check if it is possible to construct a unique triangle with the given sides and angles:
    (a) A triangle with sides 7.5cm, 3cm and 4cm.
    (b) A triangle with angles 50°, 60° and 70°.
    (c) A right triangle with sides 4cm, 5cm and 7cm.
    (d) ΔABC with ∠A = 85°, AB = 7cm and ∠B = 95°.

WEB RESOURCES:

Constructions:  http://goo.gl/VWwUJk

* Balancing Act- answer: 5 X’s will balance YYZ

* Fun Corner 1 answer:
1. State true or false. Justify each false statement with an example/reason/figure.
   (a) Two circles with the same radii are congruent.
   (b) If two rectangles have equal areas, they are congruent.
   (c) Two equilateral triangles are congruent.
   (d) If two squares have equal areas, they are congruent.
   (e) Two triangles with angles 50°, 60° and 70° are congruent by AAA criterion.
2. If AB=PQ, AC=PR and ∠A = ∠P = 40°, then by which congruence rule ΔABC ≅ ΔPQR?
3. In ΔABC and ΔPQR, AB=3.5cm, BC= 7.1cm, AC=5cm, PQ=7.1cm, QR=5cm and PR=3.5cm. Then ΔBCA ≅ _________.
4. Find the values of x and y if ΔABC ≅ ΔPQR.

5. In ΔPQR, PS is an altitude and PQ = PR. (Draw the required diagram)
   (a) Prove that ΔPQS ≅ ΔPRS.
   (b) Is PS a median also? Why or why not?
   (c) Is ∠QPS = ∠RPS? Give reason.
6. In ΔPQR, ∠P = 58°, ∠R = 72° and PR = 8cm. In ΔABC, ∠B = 72°, ∠A = 58° and AB = 8cm. Are the triangles congruent? If so, write the congruence of these triangles in correct correspondence.
7. In ΔABC, AD is the bisector of ∠A. If AD ⊥ BC, prove that AB = AC (Draw the required diagram)
8. ΔPQR ≅ ΔLMN, PQ = 20x – 8. If LM = 92cm, find the value of x.
9. If ΔABC ≅ ΔXYZ, ∠X = 65° and ∠C = 55°, then find ∠Y.
10. ΔPQR ≅ ΔLMN. Perimeter of ΔLMN is 220 cm. If the sum of two sides of ΔPQR is 130cm, what is the length of the third side of ΔLMN?
Fun and Interesting Facts About Pi

\[ \pi \]

1) Pi occurs in hundreds of equations in many sciences including those describing the DNA double helix, a rainbow, ripples spreading from where a raindrop fell into water, superstrings, general relativity, normal distribution, distribution of primes, geometry problems, waves, navigation....

2) Pi is the 16th letter of the Greek alphabet. The first person to use the Greek letter Pi was Welshman William Jones in 1706. He used it as an abbreviation for the periphery of a circle with unit diameter. Euler adopted the symbol and it quickly became a standard notation.

3) Pi is irrational. An irrational number is a number that cannot be expressed in the form \((a / b)\) where \(a\) and \(b\) are integers.

4) There is no zero in the first 31 digits of Pi.

5) The Babylonians found the first known value for Pi in around 2000BC - They used \((25/8)\).

6) The Bible uses a value of Pi of 3. Here is a verse from I Kings 7,23: And he made a molten sea, ten cubits from one brim to the other: it was round all about, and his height was five cubits: and a line of thirty cubits did compass it about.

7) Pi day is celebrated on March 14 at the Exploratorium in San Francisco (March 14 is 3/14) at 1:59 PST which is 3.14159.

Here’s a Pi limerick:

Three point one four one five nine two

It’s been around forever - it’s not new

It appears everywhere, here and there.

It’s irrational I know but its true!
Assignment - 12
COMPARING QUANTITIES

1. Ramesh and Satish contested the Delhi assembly elections. Ramesh scored 11,484 votes which was 44% of the total votes. Satish scored 26% of the votes. Calculate the number of votes cast in the village and the number of voters who did not vote for either Ramesh or Satish.

2. Lalit got 50% marks in Hindi, 75% in English and 90 marks in Maths. The maximum marks in each of the subjects were 100, 140 and 160 respectively. Find his aggregate percentage.

3. Rohit sold his chair for Rs 720 at a loss of 10%. For how much did he buy the chair?

4. A man sold an old scooter for Rs 8100 losing 10%. For how much should he have sold the scooter so as to gain 10%?

5. A man bought a car for Rs 60,000 and spent 10% of the cost of the car for the purchase of new tyres. At what price should he sell the car to make a gain of 15%?

6. I bought a washing machine for Rs 7500 and spent Rs 500 on its cartage. Due to some circumstances, I was compelled to sell it for Rs 6000. Find my loss percent.

7. Find the simple interest and amount of Rs 3500 for 2 years at 8% per annum.

8. Raju borrowed Rs 18000 from a moneylender at 12 % per annum for 5 years and Sanju borrowed the same amount at 8% per annum from the bank for 6 years. Who paid more interest and by how much?

9. Nikhil borrowed some money from a moneylender at 10% per annum. He paid Rs 3000 as interest after two years. How much money did he borrow?

10. What is the rate of interest which gives an interest of Rs 250 on a sum of Rs 5000 for 2 years?

Enrichment Exercise [Optional]:

1. The ratio of the cost price and selling price of an article is 5 : 6, find the gain percent.

2. If the simple interest on a certain sum of money for 2 years be one-fifth of the sum, then find the rate of interest per annum.

3. A certain brand of soap powder is sold at Rs 2.50 a sachet. They cost Rs 18 a dozen. What is the gain or loss percent on 3 dozen sachets?

4. A restaurant adds 10% service charge and 12% VAT on the basic price of meals. If the basic price of meal is Rs 1500, how much money do I pay for the meal?
5. Sudhir borrowed Rs 3,00,000 at 12% per annum from a money-lender. At the end of 3 years, he cleared the account by paying Rs 2,60,000 and a gold necklace. Find the cost of the necklace.

Fun Corner

Percentage Crossword

Across
1. 25% of 128 =
3. n% of 12 is 3
5. 12% of n = 7.8
7. \( \frac{66\frac{2}{3}}{3} \)% of 42 =
8. n% of 208 = 108.16

Down
1. 6% of 600 =
2. 5% of n = 12.5
4. n% of 18 = 9.9
6. \( \frac{3}{5} \)% of 2500 =
9. .4% of n = 1.024
Handouts
Handout on PROBABILITY

<table>
<thead>
<tr>
<th>0</th>
<th>1/4</th>
<th>1/2</th>
<th>3/4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Chance</td>
<td>Poor Chance</td>
<td>Even Chance</td>
<td>Good Chance</td>
<td>Sure Chance</td>
</tr>
</tbody>
</table>

Describe the chance of happening of each of the following events:
1. If today is 8th December, tomorrow will be 9th December. ______________________
2. A hundred people can fit into a car. ____________________
3. You throw a tail with a coin. ______________________
4. You throw a 3 with a die. ______________________
5. Throwing an odd number with a die. ______________________
6. You throw a number greater than 7 with a die. ______________________
7. A red marble is picked up from a bag containing 7 red & 3 green marbles. __________
8. If you work hard, you will pass the examination. ______________________
9. Three lines intersect at 4 points. ______________________
10. We can draw a triangle whose angles add up to 180 degrees. ______________________

**OUTCOMES:** An outcome is the result of a single trial of an experiment.

**PROBABILITY:** Probability = \( \frac{\text{Number of Desired Outcomes}}{\text{Number of Total Outcomes}} \)

e.g. All possible outcomes when a die is thrown are: 1, 2, 3, 4, 5 and 6

\[
\text{Probability of getting an even number} = \frac{\text{Getting a 2, 4 or 6}}{\text{Total outcomes}} = \frac{3}{6} = \frac{1}{2}
\]

**Exercise:**
1. (a) Write all the possible outcomes of picking an odd number from first 10 whole numbers: ______________________
   (b) What is the probability of picking 5? __________________
2. (a) Write all the possible outcomes of picking any letter from the word GAMES: ______________________
   (b) Find the probability of selecting the letter E: __________________
3. Write the probability of picking a vowel from the English alphabets: ______________

Contd..
4. Find the probability of picking the letter M from the word MATHEMATICS: ________

5. Tell whether the probability will be 0 or 1:
   (a) If today is Friday then yesterday was Thursday. __________
   (b) A die when thrown shall land up with number 0. __________
   (c) You are younger today than tomorrow. __________

6. List the outcomes you can see in these experiments:
   (a) Spinning the following wheel: __________________________

   (b) Tossing two coins together: ________________________________

7. Write the probability of getting D in Question 6(a): _____________

8. (a) Write all the possible outcomes of picking an integer from -7 to 3:

   __________________________________________________________

   (b) What is the probability of getting a positive integer? __________

9. What is the probability of drawing a black card from a deck of cards?

10. Write all the possible outcomes of getting a multiple of 3 from 20 to 45: _______________

    __________________________________________________________

    What is the probability of getting an even number? ________________
Handout on SYMMETRY

Rotational Symmetry:
A figure is said to have rotational symmetry about a point O if, by rotating it about O, it fits its outline at least once before it has made a complete round. The fixed point is called the centre of rotation. The angle by which the figure rotates is called the angle of rotation. The number of times a figure fits onto itself in one complete round (i.e. the number of times a figure looks exactly the same) is called the order of rotational symmetry. Look at the following figure:

In a full turn, there are precisely two positions (on rotation through 180° and 360°) when the left-right arrow looks exactly the same (apart from the points A and B). Here, the angle of rotation is 180° and the order of rotational symmetry is 2 (because the figure looked exactly same twice before completing a full round).

Now, another example:

Here, there are four positions when the figure looks exactly the same before completing a full turn. So, the order of rotational symmetry is ____. Mark the centre of rotation. Can you guess the angle of rotation? _______. How did you get that? Can you think of a formula to calculate the angle of rotation? _________________________________.

Here is one more example:

In a full turn, there are precisely three positions when the figure looks exactly the same. So, here the order of rotational symmetry is ____. Mark the approximate centre of rotation. Also, using the above formula, find the angle of rotation. _________________.

Contd..
Exercise:
1. Which of the following figures have rotational symmetry of order more than 1?

2. State the order of rotational symmetry and the angle of rotation for each figure:
3. Which of the following numbers/letters/figures have rotational symmetry?

Rotational Symmetry: ______  Rotational Symmetry: ______  Rotational Symmetry: ______
Order: ________  Order: ________  Order: ________

Rotational Symmetry: ______  Rotational Symmetry: ______  Rotational Symmetry: ______
Order: ________  Order: ________  Order: ________

Rotational Symmetry: ______  Rotational Symmetry: ______  Rotational Symmetry: ______
Order: ________  Order: ________  Order: ________

Rotational Symmetry: ______  Rotational Symmetry: ______  Rotational Symmetry: ______
Order: ________  Order: ________  Order: ________

Rotational Symmetry: ______  Rotational Symmetry: ______
Order: ________  Order: ________

Contd..
Worksheet on SYMMETRY

Colour exactly 6 squares in figures 1, 2 and 3 to make them symmetrical about the mirror line(s).

![Fig 1](image1)

![Fig 2](image2)

In fig 4, draw as many lines of symmetry as possible. Colour 8 more squares to make the figure symmetrical.

![Fig 3](image3)

![Fig 4](image4)

Complete the following figure taking dashed line as the line of symmetry.
Extra Graph Sheet
Project
Project for Second Term

Visualizing Solid Shapes

Learning Objectives:
• To visualize and describe 3D shapes.
• To investigate nets of various solid shapes.
• To explore various properties related to 3D shapes (in terms of faces, vertices, edges and surface area).
• To see the hidden parts of the solid shapes and to view them from different angles: as the front-view, the side-view and the top-view.

Important Notes:
• You may refer to your textbook for details on the topic. It is a part of your curriculum but no direct question will be asked in written exam based on this.
• The Rubric for assessment is given at the end of the Project for your reference.
• There will be negative marking for delay in submission of the project.
• This project should be submitted as a file/folder including a Cover page and the activities mentioned below.

List of Activities:

Activity 1: Give a brief introduction of Solid Shapes (Hint questions: What are solid shapes? Why are they called 3D? What are their faces, vertices and edges? etc). You can supplement your content with pictures.

Activity 2: Draw labeled nets of any 3 shapes from the list given below:
• Cuboid
• Cylinder
• Cube
• Prism
• Pyramid
• Cone

Activity 3: Derive the formula of Surface Area* for any one shape with the help of ‘net’.

*Surface Area of a 3-D shape is the sum of the areas of all its surfaces (or Faces).
**Activity 4:** For each solid, count the number of faces, vertices & edges, and complete the table given below:

<table>
<thead>
<tr>
<th>3D Shape</th>
<th>Faces</th>
<th>Vertices</th>
<th>Edges</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Cube" /></td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td><img src="image2" alt="Triangular Prism" /></td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td><img src="image3" alt="Triangular Pyramid" /></td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td><img src="image4" alt="Rectangular Prism" /></td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td><img src="image5" alt="Square Pyramid" /></td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
</tbody>
</table>

Can you observe the relation between the number of faces, vertices and edges of these solids? What is that? Find the special name given to this relation.
Activity 5: Attempt the following questions:

1. Name the views.

2. Which is the correct view as seen from the direction of arrows?
3. How many cubes do you see in the top view of the following arrangement? Draw the ‘Top View’ of the given arrangement in the box.

![Top View Diagram]

4. Which of the given patterns can be folded to get the cube shown?

![Completed Cube]

Patterns:

A

B

C

D

5. Find all the ways to cut out a ‘net’ of six squares that can be folded into a cube. Two are shown as examples. Draw your figures on a separate sheet.

![Net Diagrams]
## RUBRIC FOR THE PROJECT ON SOLID SHAPES

<table>
<thead>
<tr>
<th>Activities</th>
<th>Marks</th>
<th>2</th>
<th>1.5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity 1: Introduction</strong></td>
<td></td>
<td>All information is correct and relevant with proper examples/ figures.</td>
<td>Most information is correct and relevant with proper examples/ figures.</td>
<td>Some information is correct and relevant with proper examples/ figures.</td>
</tr>
<tr>
<td><strong>Activity 2: Nets</strong></td>
<td></td>
<td>All nets are drawn accurately and labelled properly.</td>
<td>Almost all nets are accurate and labelled.</td>
<td>Nets not drawn accurately/ labelling missing.</td>
</tr>
<tr>
<td><strong>Activity 3: Surface Area</strong></td>
<td></td>
<td>The formula for Surface Area derived correctly showing all the required steps.</td>
<td>The formula for Surface Area derived correctly showing most of the required steps.</td>
<td>Formula derived but steps not shown.</td>
</tr>
<tr>
<td><strong>Activity 4: Relation b/w F, V and E</strong></td>
<td></td>
<td>All blanks filled and relation between faces, vertices and edges derived correctly.</td>
<td>Most blanks filled and relation between faces, vertices and edges derived correctly.</td>
<td>Some blanks filled/relation between faces, vertices and edges not correct.</td>
</tr>
<tr>
<td><strong>Activity 5: Questionnaire</strong></td>
<td></td>
<td>All the questions are attempted correctly.</td>
<td>Most of the questions are attempted correctly.</td>
<td>Some questions are attempted correctly.</td>
</tr>
</tbody>
</table>
Activity Sheets
FLOWCHART

Find the missing number:

? -> Add 13 -> Multiply by −5 -> Divide by 10 -> 3

MAGIC SQUARE

A Magic Square is a grid of numbers in which the numbers in each row, column and diagonal add up to the same number. Complete the given magic square.

<table>
<thead>
<tr>
<th>(2of3^2)</th>
<th>(-3 \times -4)</th>
<th>(-4 + 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-19\frac{1}{5} + \frac{4}{5})</td>
<td>(-7\frac{2}{3} - 1\frac{1}{3})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>(\frac{6}{0.3})</td>
</tr>
<tr>
<td>([-10 - 4])</td>
<td></td>
<td>-5</td>
</tr>
</tbody>
</table>
Worksheet on PERCENTAGE

Express each number as a per cent and from the Start position move from a smaller number to a bigger one along the path till you reach the Finish point.

\[ \begin{align*}
&\text{Start} & 0.02 & \frac{4}{100} & \frac{3}{50} & 8 & 0.19 \\
& & \frac{2}{25} & 0.1 & \frac{12}{100} & 0.11 & \frac{1}{5} \\
& & \frac{51}{100} & \frac{31}{100} & 0.35 & \frac{3}{10} & \frac{3}{20} \\
& & \frac{1}{10} & \frac{9}{25} & \frac{7}{100} & \frac{4}{10} & \frac{3}{5} \\
& & \frac{2}{5} & \frac{5}{10} & 0.55 & \frac{14}{25} & \frac{63}{100} \\
& & \frac{1}{4} & \frac{13}{50} & \frac{12}{25} & 0.65 & 0.81 \\
& & \frac{1}{20} & \frac{3}{20} & \frac{3}{4} & \frac{40}{50} & \frac{100}{100} \text{ Finish}
\end{align*} \]

‘JUMBLE’

Rearrange the letters in these five Jumbles, one letter to each square/circle, to make five words:

OGYPONL

HTENPSEUYO

GTRHI

TACGOON

LIRTANAO

Now arrange the circled letters to form the answer to the question:

Name the famous Greek mathematician and philosopher who is also known as ‘the father of numbers’.
GEOMETRIC CONCEPTS-CROSS WORD

ACROSS:
1. Line segments forming a polygon
3. Two exactly same triangles joined vertex to vertex (e.g. Kaleidoscope)
4. Lines that do not meet
5. Points lying on the same line
6. Half of diameter
8. A curve whose end-points do not meet
9. Each of the two rays forming an angle is called its ______
11. Angle whose measure is between 90° and 180°
12. Drawings of unfolded 3-D figures are called ______

DOWN:
1. A curve that does not cross itself
2. Football is an example of which 3-D figure?
4. A closed curve made up of line segments only
6. The interior of a curve together with its boundary
7. A triangle with all unequal sides
10. Middle terms of a proportion are also called _________
SUDOKU

Sudoku is a puzzle in which numbers 1 to 9 are inserted in a 9x9 grid subdivided into further nine 3x3 squares in such a way that every number appears only once in each row, column and square.
Word Search

IS
EJXR
UBGEMI
HEACDASR
YSSTRIROLA
ASFANAAGSADE
IOENVETMOCRCIN
QLNGRVCIELEEYEOI
AZMLTFAROTTELTLSSLBL
XCEUXEIEENELEAIBHMC
XADUHLJRPERLSLNAAEKC
FDIATTNETPAEIDIPAM
ADMRIASZREWREN
RIATOPITANDRAS
ATRELDPOAEV
DIYRUUECUU
IOPPMMQ
UNXXEA
SMBS
KY

LINEAR VARIABLE
ADDITION RATIO
PERCENTAGE NETS
SHAPES PYRAMID
MULTIPLE ISOSCELES
PARALLELOGRAM QUADRILATERAL
AREA VOLUME
CONE CYLINDER
DIAMETER CUBOID
RADIUS QUARTER
MEDIAN MEAN
RECTANGLE LOSS
INTEREST
Try to unscramble the words below. Good Luck!

1. BAGAREL
2. XTRVEE
3. MYLPOCNAEIMR
4. NPHUEOSTYE
5. GTRIH
6. YRPMIAD
7. GTAOCN
8. AOLSUTEB
9. TPENNESXO
10. IATOR
11. OPTRIOPNOR
12. ENAIOURMTNS
13. TENECPREAG
14. ALIARETEQU
15. COSELISES
16. INEMDA
17. ODEM
18. CLICRE
19. LPMLLEAARORAG
20. ETINLARG
21. HRITECTMIA
22. CONFIASRT
23. OVIIDSN
24. ASBDOM
25. ECALESN
26. ILATQEUDDLARRA
27. RSIMP
28. NRCEDYIL
29. EONC
30. OSMDSNNEI
31. LALEPLA
32. RCNTOCCENI
33. RNRCECUNOT
34. ESINL
35. IOPTN
36. TENGMES
37. CEOOSTR
38. AUSIRD
39. ECMALID
40. DRDHNHUE
A game for 2 - 4 players: Players take it in turns to join any two dots with a vertical or horizontal line. A player that completes a square with his line captures that square, places his initials in it and gains another turn. When all the squares are complete, players total the values of each square they have captured. The player with the lowest score wins.
**PUZZLE TIME**

1) I am a number, Tell my Identity!
   Take me seven times over, and add a fifty!
   To reach a triple century,
   You still need forty!

2) It’s a rainy season, Let’s think of the reason.
   A unit fraction remains the same,
   When, when, when!

**RHYME TIME**

Read the following poem and complete by adding your own lines.

Parks and fences
And tiles on the wall,
The frame of a photo
Is something common in all?

Give it a thought,
Don’t be a cheater....
Sometimes, we find the area
Sometimes, the perimeter.....
Multiple Choice Questions for First Term

1. The product of $\frac{-7}{9}$ and $x$ is 1. What is the value of $x$?
   (i) $\frac{16}{9}$   (ii) $\frac{7}{9}$   (iii) $\frac{9}{7}$   (iv) $\frac{-9}{7}$

2. The product of the smallest positive integer and the greatest negative integer is
   (i) 1   (ii) 0   (iii) -1   (iv) None of the above

3. The area of a parallelogram with base 12cm and altitude 6cm is
   (i) 36cm$^2$   (ii) 72cm$^2$   (iii) 27cm$^2$   (iv) 63cm$^2$

4. The average of the even numbers from 1 to 30 is
   (i) 17   (ii) 15   (iii) 16   (iv) 19

5. The absolute value of $-17 + 24 + 4(-2)$ is
   (i) 29   (ii) 5   (iii) 11   (iv) 20

6. 4 bags contain different number of black and white marbles as follows:
   - RED bag : 3 white and 4 black
   - BLUE bag : 3 white and 6 black
   - GREEN bag : 4 white and 5 black
   - YELLOW bag : 4 white and 7 black
   From which bag do white marbles have the greatest chance of being drawn at random?
   (i) Blue   (ii) Yellow   (iii) Green   (iv) Red

7. The area of a triangle is 84cm$^2$. Its base is 14cm, the altitude will be
   (i) 6cm   (ii) 3cm   (iii) 12cm   (iv) 7cm

8. Which of the following rational numbers is closest to zero?
   (i) $\frac{-5}{12}$   (ii) $\frac{-2}{3}$   (iii) $\frac{-5}{6}$   (iv) $\frac{-3}{4}$

9. The circumference of a circle is 176 cm. Its diameter is
   (i) 5.6 cm   (ii) 28 cm   (iii) 56 cm   (iv) 42 cm

10. If $2^x \times 3^x = 216$, then the value of $x$ is
    (i) 36   (ii) 3   (iii) 6   (iv) 216

11. The product of 10 positive and 10 negative integers is
    (i) Even   (ii) Zero   (iii) Positive   (iv) Negative

12. If $(-1)^x = 1$, then $x$ should be
    (i) Positive   (ii) Negative   (iii) Odd   (iv) Even

13. In Ques 13, the mean score of Rahul is
    (i) 50   (ii) 51   (iii) 53   (iv) 55

14. Two complementary angles are in the ratio 1:5. What is the difference between their measures?
    (i) 15°   (ii) 60°   (iii) 75°   (iv) 45°
15. The following graph shows the number of runs scored by Rahul and Sachin in 5 matches during a tournament:

In which match did they score the highest number of runs together?
(i) 1st (ii) 3rd (iii) 4th (iv) 5th

16. The range of 3.5, 2, 4.5, 8.7, 1.9, 3.2, 1.9 is
(i) 1.5 (ii) 6.8 (iii) 2.6 (iv) 3.2

17. Which of the following statements is correct?
(i) Two angles forming a linear pair are supplementary.
(ii) If a transversal cuts two parallel lines, then pairs of alternate interior angles are supplementary.
(iii) Two supplementary angles always form a linear pair.
(iv) The complement of 80° is 100°.

18. The diameter of the wheel of a car is 70 cm. How much distance will it cover in 100 revolutions?
(i) 220 cm (ii) 2200 cm (iii) 22 m (iv) 220 m

19. If \(2^3 + 1^3 = 3^x\), then the value of \(x\) is
(i) 2 (ii) 3 (iii) 6 (iv) 1

20. The value of \(\left(4^0 - 5^0\right) \times (-6)^2\) is
(i) 36 (ii) -36 (iii) 1 (iv) 0

21. The value of \((4 - 5)^0 \times (-6)^2\) is
(i) 36 (ii) -36 (iii) 1 (iv) 0

22. Two sides of a triangle measure 7 cm and 9 cm. The length of the third side can be
(i) 17 cm (ii) 18.5 cm (iii) 2 cm (iv) 7.9 cm

23. The probability of drawing a black ball from a bag containing 5 black and 3 red balls is
(i) \(\frac{5}{3}\) (ii) \(\frac{3}{5}\) (iii) \(\frac{5}{8}\) (iv) \(\frac{3}{8}\)

24. Mode of a set of observations is the value which
(i) represents the whole data
(ii) is one of the given mid values
(iii) occurs most frequently
(iv) divides the data into two equal parts
25. The value of $\frac{30 - 15^0}{30 + 15^0}$ is
   (i) $\frac{2}{3}$   (ii) 0   (iii) 1   (iv) Not defined

26. A pair of integers whose sum is -10 is
   (i) -10, 20   (ii) 10, -20   (iii) -5, 15   (iv) 40, -30

27. $-5^2$ is equal to
   (i) -10   (ii) -25   (iii) 25   (iv) None of the above

28. The median of 3, 3, 3, 7, 10, 12, 12, 14, 15, 20 is
   (i) 10   (ii) 12   (iii) 11   (iv) 3

29. Linear pair angles are also
   (i) complementary angles   (ii) supplementary angles   (iii) equal angles   (iv) none

30. Two sides of an isosceles triangle measure 5cm and 12cm. Length of the third side can be
   (i) 13cm   (ii) 12cm   (iii) 5cm   (iv) 8cm

31. Dilip’s front door is 6 feet wide and 8 feet tall. He wants to purchase a circular table. What is the maximum diameter of the table that can fit through the front door?
   (i) 8 feet   (ii) 9 feet   (iii) 11 feet   (iv) 14 feet
Multiple Choice Questions for Second Term

1. A triangle can be constructed with sides (in cm):
   (a) 4, 8, 2  (b) 4, 4, 8  (c) 3, 6, 3  (d) 7, 8, 9

2. In a right angled \( \triangle ABC \) if, \( AB^2 = AC^2 + BC^2 \) then the right angle is
   (a) \( \angle BAC \)  (b) \( \angle ABC \)  (c) \( \angle ACB \)  (d) \( \angle CBA \)

3. The simple interest on Rs 500 at 10% p.a. for two years is
   (a) Rs 550  (b) Rs 50  (c) Rs 100  (d) Rs 150

4. An article is sold at Rs 225 at a loss of 10%. Its cost price is
   (a) Rs 235  (b) Rs 250  (c) Rs 240  (d) Rs 275

5. An article bought for Rs 400 is sold for Rs 472. The gain is
   (a) 18%  (b) 15.25%  (c) 15%  (d) 19%

6. A chair costing Rs 450 is sold at a gain of 12%. Its selling price is
   (a) Rs 54  (b) Rs 595  (c) Rs 504  (d) Rs 395

7. The triplet which does not give a right angled triangle is
   (a) 2.5, 1.5, 4  (b) 5, 4, 3  (c) 5, 12, 13  (d) 6, 8, 10

8. Mr Khanna had Rs \( x \). He gave one-third of the total money to his wife and one-fourth of the remainder to his son. How much money is left with him?
   (a) \( \frac{2x}{3} \)  (b) \( \frac{1x}{6} \)  (c) \( \frac{3x}{4} \)  (d) \( \frac{1x}{2} \)

9. If \( 3x \) and \( 4a \) represent the two opposite sides of the same rectangle, then which of the following is incorrect?
   (a) \( 3x = 4a \)  (b) \( x = \frac{4a}{3} \)  (c) \( a = \frac{3x}{4} \)  (d) Area = \( 3x \times 4a \)

10. If \( \triangle ABC \cong \triangle DEF \), then
    (a) \( AC = EF \)  (b) \( AB = DE \)  (c) \( BC = DF \)  (d) \( AC = EF \)

11. If \( \triangle PQR \cong \triangle XYZ \), then
    (a) \( \angle P = \angle Z \)  (b) \( \angle Q = \angle X \)  (c) \( \angle R = \angle Z \)  (d) \( \angle P = \angle Y \)

12. If \( AB = PQ, \angle A = \angle P \& \angle B = \angle Q \), then \( \triangle ABC \cong \triangle PQR \) by
    (a) SSS rule  (b) SAS rule  (c) AAS rule  (d) ASA rule

13. In \( \triangle ABC \), \( AB = AC \) and \( AD \perp BC \), then \( \triangle ABC \cong \triangle ACD \) by
    (a) SSS rule  (b) ASA rule  (c) SAS rule  (d) RHS rule

14. Which expression gives the perimeter of the given rectangle?
   \[
   \begin{array}{c}
   \begin{array}{c}
   \text{3x} \\
   \text{2y}
   \end{array}
   \end{array}
   \begin{array}{c}
   \begin{array}{c}
   \text{2y} \\
   \text{3x}
   \end{array}
   \end{array}
   \]
   (a) \( 6xy \)  (b) \( 36xy \)  (c) \( 9x + 4y \)  (d) \( 6x + 4y \)
15. The algebraic expression for the statement ‘product of \(x\) and \(y\) subtracted from the product of \(a\) and \(b\)’ is
   (a) \(xy - ab\) (b) \(ab - xy\) (c) \(ax - by\) (d) \(ay - bx\)

16. If \(\triangle ABC \cong \triangle PQR\), then which of the following is false?
   (a) \(\angle ABC = \angle PQR\) (b) \(AB = QR\) (c) \(AC = PR\) (d) \(\angle BCA = \angle PRQ\)

17. Which of the following is a true statement?
   (a) Two circles are congruent.
   (b) Two equilateral triangles are congruent.
   (c) Two squares having same perimeters are congruent.
   (d) Two rectangles having same perimeters are congruent.

18. \(\frac{3}{4}\) when changed to percent, we get
   (a) 7.5\% (b) 0.75\% (c) 75\% (d) 750\%

19. If \(\triangle TWN \cong \triangle PRQ\), then \(\angle W\) is equal to
   (a) \(\angle P\) (b) \(\angle N\) (c) \(\angle Q\) (d) \(\angle R\)

20. If \(m = 1\), \(n = 2\) and \(k = -1\), then the value of \(3k^2m^3n\) is
   (a) 6 (b) \(-6\) (c) 9 (d) None

21. If \(3x - 4 = 2 + 5x\), then the value of \(x\) is
   (a) \(-3\) (b) 3 (c) \(\frac{3}{4}\) (d) \(\frac{-1}{4}\)

22. From a ribbon ‘y’ metre long, a piece of ‘x’ metre has been cut. The length of the remaining piece (in metre) is
   (a) \(y + x\) (b) \(x - y\) (c) \(y + x\) (d) \(y - x\)

23. The order of rotational symmetry in the letter ‘N’ is
   (a) 3 (b) 2 (c) 1 (d) 4

24. The result of adding 9 to the twice a number is 31. The number is
   (a) 20 (b) 15 (c) 11 (d) 17

25. One of the possible equations of the solution \(a = 3\) is
   (a) \(3a = 6\) (b) \(a - 2 = 5\) (c) \(a + 3 = 9\) (d) \(a + 5 = 8\)

26. If \(\frac{m + 3}{5} = 7\), then the value of \(m\) is
   (a) 20 (b) 32 (c) \(\frac{35}{3}\) (d) None of the above

27. If \(\frac{m}{5} + 3 = 7\), then the value of \(m\) is
   (a) 20 (b) 32 (c) \(\frac{35}{3}\) (d) None of the above
28. A triangle has sides of length 2cm, 5cm and 6cm. Which of the following statements is true for the triangle?
   (a) The triangle has a 90 degree angle.
   (b) The triangle does not have a 90 degree angle.
   (c) The hypotenuse is 6cm.
   (d) The triangle may or may not have a 90 degree angle.

29. A boy earns Rs. X in a month and spends Rs. Y in a month. His savings for the month are:
   (a) Rs. (x+y)    (b) Rs. (x – y)    (c) Rs. (y – x)    (d) Rs. (-x – y)

30. The numerical coefficient of x2 in the expression x3 – 7x2 + 8x + 4 is
   (a) 1    (b) -7    (c) 8    (d) 4
Question Bank for First Term

1. Find the value of x in each case:
   (a) \((3)^{x-1} = 243\)
   (b) \((2)^{3x} = 64\)
   (c) \(1^3 + 2^3 + 3^3 = x^2\)
   (d) \(\left(\frac{-7}{8}\right)^{15} + \left(\frac{-7}{8}\right)^x = \left(\frac{-7}{8}\right)^2\)

2. In a quiz, if Shamit gets +10 in each of the first three rounds, -7 in the next two rounds each, +8 in the next two rounds each and -4 in each of the last three rounds, find his total score at the end of the quiz.

3. Arrange the following in descending order:
   \(-3\frac{4}{3}, -\frac{5}{6}, -2, \frac{4}{5}\)

4. Simplify: \[[-9 - 2\{-3 \times (-15) + (-5 + 2)\}] + 7\]

5. If \(\frac{p}{q} = \left(\frac{2}{5}\right)^5 \times \left(\frac{2}{5}\right)^{-2}\), then find the value of \(\left(\frac{p}{q}\right)^2\).

6. Simplify using suitable property:
   (a) \(-51 \times 48 - 49 \times 48\)
   (b) \(23 \times 61 \times 5 - 61 \times 115\)
   (c) \(-21 \times (-74) + (-26) \times (-21)\)

7. Simplify and answer in exponential form using laws of exponents:
   a) \(\left(3^3 \times 3^2\right)^7\)
   b) \(\frac{3^6 \times 7^6 \times 11^8}{21 \times 11^3}\)
   c) \(\left(\frac{7^8}{7^5}\right)^2\)
   d) \(\left(5^2 \times 5^4\right)^3 + 5^3\)

8. Solve the following equations:
   a) \(13x - 14 = 9x + 10\)
   b) \(2(x + 3) + 3(x + 1) = 4(2x - 3) + 3\)
   c) \(\frac{7x}{10} - 8 = 14\)
   d) \(5 - 2(4 - 3x) = 5x - 11\)

9. Subtract the sum of \(7x^2 - 4y^2\) and \(4x^2 + 3xy - 4y^2\) from the sum of \(5x^2 - 3xy - y^2\) and \(x^2 + 2xy - 2y^2\).

10. Simplify (wherever required) and evaluate the given expressions for \(a = 2, b = -3\) and \(c = 4\):
    a) \(-3a + b + c^2\)
    b) \(5ab + 2(-ab + c) - 3c\)
    c) \(b^2 - ac + a^3 - 5b^2 + 3ac\)
11. Simplify each of the following:
   (a) \(-7x - 8y^3 + 3(4 - x) - 2(y^3 + 6)\)
   (b) \(12a^2b - \left(7b^3 - 5b^2a + 8a^2\right) - \left(-3b^3 + a^2\right)\)

12. The population of Delhi state in different census years is as given below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population  (in lakhs)</td>
<td>41</td>
<td>62</td>
<td>94</td>
<td>138</td>
<td>168</td>
</tr>
</tbody>
</table>

Represent the above information by means of a bar graph (taking scale of 10).

13. What must be subtracted from \(4a - 3b + 2c\) to get the sum of \(b - c + 2a - 1\) and 
\(-6c + a + 3 - 2b\)?

14. Subtract \(A\) from \(B\) if \(A = -7 \times (-8) - 10\) and \(B = -15 - 20 + 5 + 2\).

15. Find the median and the mode of the given data:
   21, 24, 19, 18, 45, 14, 19, 21, 24, 18, 30, 31, 26, 25, 19, 17, 18, 20, 22

16. Find the product using suitable properties:
   (i) \((-50) \times 125 \times (-6) \times 8\)
   (ii) \(213 \times (-35) + (-213) \times 65\)

17. Jyoti cuts a 21 m long rope into pieces of \(\frac{3}{2}\) m length each. How many pieces of the rope did she get?

18. Two supplementary angles are such that one is \(\frac{4}{5}\) of the other. Find them.

19. Find the value of
   (a) \(7^0 \times 7^0 \times 7^0 \times (7^0 - 7^0)\)
   (b) \(\frac{2^0 \times 5^0 \times 8^0}{2^0 + 5^0 + 8^0}\)

20. Which of the following statements is false and why?
   (a) In the pair of complementary angles, both the angles are acute.
   (b) In the pair of supplementary angles, both the angles are obtuse.

21. Write the possible outcomes for the following:
   (a) Choose a colour from the colours of the rainbow.
   (b) Two coins are tossed simultaneously.

22. Simplify: \(14 - \left[3 + \left(8 + (5 - 3\sqrt{2} + 3)\right)\right]\)

23. Find \(x\) using laws of exponents:
   (a) \(8 \times 2^{x + 2} = 32\)
   (b) \(3^3 \times x^3 = 216\)
24. A number is selected at random from a set of natural numbers from 1 to 50. What is the probability that it is an (i) even number (ii) a prime number (iii) a multiple of 5?

25. Suman has drawn fig (i) and Sneha has drawn fig (ii). Both of them have marked line $l$ as the transversal. Who is wrong and why?

![Fig (i)](image1)  ![Fig (ii)](image2)

26. The marks obtained by a group of students in science tests are 85, 74, 90, 85, 39, 48, 56, 95, 80, 78 and 40. Find
(a) Mean marks obtained by the group.
(b) Median of marks obtained.
(c) Mode and range of marks obtained.

27. In the following figure $AB \parallel CD \parallel RT$ and $\angle EPA = 50^\circ$. Find the value of $\angle EQC$ and $\angle ERT$.

![Figure](image3)

28. (a) An elevator at the ground level descends into a mine shaft at the rate of 5 metre per minute. What will be its position after $\frac{3}{2}$ hrs?
(b) If it begins to descend from 25 m above the ground, what will be its position after 35 minutes.

29. The performance of a student in the term examination is given below:

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindi</td>
<td>72</td>
</tr>
<tr>
<td>English</td>
<td>80</td>
</tr>
<tr>
<td>Maths</td>
<td>95</td>
</tr>
<tr>
<td>Science</td>
<td>75</td>
</tr>
<tr>
<td>Social studies</td>
<td>67</td>
</tr>
</tbody>
</table>

Draw a bar graph by choosing an appropriate scale.
30. Lines m and n are parallel to each other. The two interior angles on the same side of the transversal are $(x - 8)\degree$ and $(5x - 4)\degree$. Find the measure of each angle.

31. If $P = (x^2 + 7x)$ and $Q = (-x^2 - 3x + 2)$, find the value of $2P - Q + 8$.

32. Find the measure of all angles in the following figures

![Diagram](image.png)

33. In the adjoining figure, name
   (i) a pair of complementary angles.
   (ii) a pair of vertically opposite angles.
   (iii) a pair of adjacent angles.
   (iv) a linear pair.
   (v) equal supplementary angles.

34. Fill in the blanks:
   (a) $8\degree + 5\degree + 7\degree = _____$.
   (b) The additive inverse of $-1$ is _____.
   (c) If $(5^4)^x = 5^{12}$, then $x = ____$. 
   (d) $-36 \div 4 (3) = _____$
   (e) The number of terms in $-4pr \times r$ is _______.

35. What additional information is needed for the following statements to be true?
   (a) Two supplementary angles form a linear pair.
   (b) If two lines are cut by a transversal, then pairs of alternate interior angles are equal.
Question Bank for Second Term

1. a) Find 25% of 600m.
   
b) Express $1\frac{1}{4}$ as percent.
   
c) What percent is 120 cm of 14.4 m?
   
d) Find the number which is 27% more than 2000.

2. The sum of 4 consecutive odd numbers is 96. Find the difference between the greatest and the smallest of them.

3. In the given figure, $\triangle ACB \cong \triangle DCA$.
   Find the values of $x$, $y$ and $z$.

4. A wire in the form of a rectangle with dimensions 70cm & 40 cm is bent into the form of a circle. Find the diameter and the area of the circle.

5. a) The area of a rectangular sheet is 500 cm². If the length of the sheet is 25cm, what is its width? Also find the perimeter of the rectangular sheet.
   
b) From that sheet, a right triangle of sides 6cm, 8cm and 10cm and a circle of radius 10.5cm are cut. Find the area of the remaining sheet.

6. If the diameter of a bicycle wheel is 70 cm, find how many times the wheel will revolve in order to cover a distance of 110 m.

7. $\triangle QPR \cong \triangle ZYX$, then
   a) $\angle R = \ldots$
   
b) $QR = \ldots$
   
c) $XY = \ldots$

8. In $\triangle PQR$, PX is the perpendicular bisector of QR. Show that $\triangle PQR$ is an isosceles triangle.
   (Draw the required diagram)

9. In the given figure, EF $\perp$ FG, HG $\perp$ FG and FH = GE.
   i. State the three pairs of equal parts in $\triangle HGF$ and $\triangle EFG$.
   
   ii. Prove that $\triangle HGF \cong \triangle EFG$.

10. A man purchased a cycle for Rs 800 and sold it for Rs 1040. Find his gain percent.
    For how much should he have sold it to gain 35%?

11. Is it possible to have a triangle of sides 11cm, 19cm and 8cm? Justify your answer.

12. Is it possible to have a triangle with angles 71°, 64° and 35°? Why or why not?
13. The figure shows a washer with a hole in it. The outer radius is 10 cm and the inner radius is 4 cm. Find
   (1) Area of the metal used.
   (2) Cost of painting each washer at the rate of 10 paise per sq cm.
   (3) Cost of painting 100 such washers.

14. Find the marked angles in the following figures:

15. An exterior angle of a triangle measures 150°. If one of the two interior opposite angles is four times the other, find the two angles. Also find the interior adjacent angle. (Show the required working with the help of a diagram)

16. Construct ΔXYZ such that XY = 6 cm, ∠ZXY = 30° and ∠XZY = 105°.

17. Construct a right ΔABC right angled at B such that AC = 7.5 cm and AB = 4.5 cm.

18. The two sides of a triangle are 8 cm and 11 cm. Find the minimum and the maximum possible length (in whole numbers) of the third side.

19. The three angles of a triangle are in the ratio 5 : 6 : 7. Find their measures. What kind of triangle is it?

20. Sonam is wrapping this present.

21. After rotating by 60° about a centre, a figure looks exactly the same as its original position. At what other angles will this happen for the figure?

22. What letters of English alphabet have rotational symmetry about a centre? Also, state the order of rotational symmetry in each case.

23. The price of milk rises from Rs 30 per L to Rs 34.50 per L. Find the percentage increase in the price of the milk.

24. Find the angle of rotation if the order of rotational symmetry is 24.

25. In how much time will Rs 9000 amount to Rs 9810 at 3% p.a. simple interest?
26. Reeta says that she has 7 toffees more than 5 times the toffees Pooja has. If Pooja has 37 toffees, how many toffees does Pooja have?

27. A sum of money triples itself in 10 years. Find the rate of simple interest per annum.

28. During break time, two-fifth of the total students play football, one-fourth go to canteen, one-fifth play table tennis and the remaining 6 students stay in class. Find the total number of students in the class.

29. Solve:
   
   (a) \( \frac{x - 3}{4} = \frac{5 - 2x}{3} \)
   
   (b) \( \frac{2m}{5} - \frac{3}{2} = \frac{1}{10} \cdot 3m \)
   
   (c) \( 3 - 5x + 2x = -2 - 2(1 - x) \)

30. In the given figure, find the values of \( x \) and \( y \).

31. In his will, a father divides his property (worth Rs 20 lakhs) between his two children and a servant. He gives 20% share each to his son and daughter.
   (a) How much does his servant get (in amount)?
   (b) What values of the father are reflected in this situation?
   (c) Do you think the children and the servant should get an equal share?
   (d) What does this reflect about our society’s character?

32. A shopkeeper had 150 LCD television sets of different companies. During the festive season, he sold 126 of them on a no return and no guarantee basis and at an attractive price less than the market price. However, all the 126 television sets came out be defective and the shopkeeper had to close down his shop owing to pressure from angry buyers and the companies.
   (a) What is the number of LCD television sets that were not defective? Express it as a percentage.
   (b) Comment on the character of the shopkeeper.

33. Anu donates one-third of her salary to an orphanage and keeps the remaining salary i.e. Rs 20,000 to meet her expenses.
   (a) Find Anu’s salary.
   (b) What value of Anu is being depicted here?
34. A man wants to fence the circular garden of diameter 14m with a rope. He gives Rs 500 to his gardener to purchase the rope the cost of which is Rs 4 per meter. After purchasing the rope, the gardener returns Rs 124 as balance.
   (a) Find the length of the rope required to fence the garden.
   (b) Is the gardener an honest man? Give reasons for your answer.

35. The following figures show two types of chocolates

(a) Identify the shapes of the two types of chocolates.
(b) The company sells both the types of chocolates at Rs 24 each. Do you think it is fair to charge the same price for both kinds of chocolates? Give reasons for your answer.
Sample Paper for First Term

Section A

Q1. Find the value of $|−26| − |−11|$.

Q2. The sum of $\frac{-1}{2}$ and its multiplicative inverse is ________.

Q3. $4(\text{xy})^2$ and $-4\text{x}^2\text{y}^2$ are ________(like/unlike) terms.

Q4. Write a pair of integers whose product is $-48$.

Q5. Lines $l$ and $m$ are intersected by a transversal $p$. A pair of co-interior angles measures $80^\circ$ each. Is $l$ parallel to $m$? Give reason.

Section B

Q6. Put $<$, $>$ or $=$ and show the required working: $\frac{2^3}{7} \quad \frac{(2)^3}{7}$

Q7. By selling apples at the rate of Rs $5\frac{1}{4}$ per apple, a fruit seller earns Rs $1260$. Find how many dozens of apples did he sell?

Q8. Two complementary angles are in the ratio $1 : 3$. Find the measures of the angles.

Q9. Is the value of $2^9 \times 2^{11} - 2^{19} \times 2^{81} = 1$? Show the required working.

Q10. Draw a pair of:
   a. adjacent angles that are not forming a linear pair.
   b. angles having a common vertex and a common arm but are not adjacent.

Q11. Write $6561$ in its exponential form. Show the required working.

   OR

   Write in the expanded form:
   a. $3p(qr)^2$
   b. $(-4y)^3x^2$

Q12. Find Rima’s chances of winning the following game:
   a. If the shaded numbers are her lucky numbers, what is the probability of her picking a lucky number?
   b. What is the probability of her picking the number $5$?

Q13. Use distributive property, to solve:
   $(26 \times -4) + (13 \times 2 \times 104)$

Q14. Consider the algebraic expression: $a^3 + 3\text{x}^2\text{y} - 4\text{z}^3$
   a. Separate the terms.
   b. Write the coefficient of $y$.

Q15. Find the mean of the first five prime numbers.

Section C

Q16. What should be added to $x + 3y - 4z$ to get $3x - 2y + z$?

Q17. Find the value of:
   \[
   \frac{1}{5} \div \frac{1}{5} \text{ of } \frac{1}{5} \\
   \frac{5}{5} \text{ of } 5 \div \frac{5}{5}
   \]

Q19. Divide the additive inverse of \( \frac{-2}{5} \) by the multiplicative inverse of 40.

Q20. Simplify using the laws of exponents: \( \frac{(2^5)^3 \times -3}{8^3 \times 7} \).

Q21. In the given figure, name an angle:
   a. alternate interior to \( \angle h \).
   b. corresponding to \( \angle a \).
   c. forming a linear pair with \( \angle g \).
   d. adjacent to \( \angle c \).
   e. co-interior with \( \angle b \).
   f. vertically opposite to \( \angle f \).

Q22. Find the value of \( (8 - 24) - [-4 - 10 \div 2 + 1] \)

OR

Draw a factor tree of \( 2x^2 + 3xy^3 - 5 \)

Q23. An elevator is 25m below the ground level and it ascends at the rate of 5m per minute. Find the time taken by it to reach 50m above the ground.

Q24. 30 students were asked to choose their favourite sport according to the following codes:
   A- Cricket   B- Football   C- Hockey   D- Any other
   The survey resulted in the given data:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>B</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>D</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>C</td>
<td>C</td>
<td>D</td>
<td>A</td>
<td>D</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>D</td>
</tr>
</tbody>
</table>

   a. Prepare a frequency distribution table for the above data.
   b. Which out of mean/median/mode will help us decide the favourite sport amongst the students?

Q25. In the given figure, \( AB \parallel CD \parallel EF \).
   Find the value of \( x \) and \( y \).
Section D

Q26. Subtract $-4x^2 + 2y - 5$ from the sum of $5x^2 - 8y - 9$ and $-x^2 + 6y - 12$. Is the algebraic expression hence formed a monomial/binomial/trinomial?

Q27. An electrical company earns a profit of Rs 1500 on every television and loss of Rs 1000 on every refrigerator.
   a. The company sells 250 pieces of televisions and 225 refrigerators in a month. What is its profit/loss?
   b. Find the number of televisions it must sell to have neither profit nor loss, if the number of refrigerators sold in a year is 1350.
   c. Write a way to conserve electricity.

Q28. Find the error and correct the following:
   a. $4^5 \times 7^5 = 11^5$
   b. $36p + 4p + 5q + 15q = 60pq$
   c. Probability of picking an ace from a deck of 52 cards is $\frac{1}{52}$.
   d. $(-1)^{40} = -1$
   e. 

Q29. The literacy rate of women in some states in India is as follows:

<table>
<thead>
<tr>
<th>STATES</th>
<th>Andhra Pradesh</th>
<th>Delhi</th>
<th>Assam</th>
<th>Uttar Pradesh</th>
<th>West Bengal</th>
</tr>
</thead>
<tbody>
<tr>
<td>LITERACY RATE</td>
<td>52%</td>
<td>75%</td>
<td>47%</td>
<td>43%</td>
<td>69%</td>
</tr>
</tbody>
</table>

   a. Prepare a bar graph of the above data using the scale as 1 unit = 5%
   b. Write the importance of female literacy.

Q30. In the given figure, $PQ \parallel XY$.
   Find the value of a, b, c, d, e.
Sample Paper for Second Term

Section A

1. Write the mathematical equation for the following:
   If 8 is taken away from the number n the result is 4.

2. Find the area of the biggest possible circle cut out from a square sheet of side 14cm.

3. In a transaction, if there is a loss of 20%, then S.P = C.P – 20% of _______

4. Name a quadrilateral which has rotational symmetry of order more than two.

5. In the given figure, AD and BC bisect each other at E. Which statement is true?
   (a) \( \triangle AEB \cong \triangle ECD \)
   (b) \( \triangle AEB \cong \triangle DEC \)
   (c) \( \triangle AEB \cong \triangle EDC \)

Section B

6. If 25% of a journey is 750 km, how long is the whole journey?

7. Leela walks 8m west and 15m north to reach the opposite corner of a rectangular Field. Lovely walked from the same point diagonally to the opposite corner. Find the distance walked by lovely.

8. What is the angle of rotation and the order of rotational symmetry of a ceiling fan with three blades when seen from directly under the fan?

9. In the adjacent figure, find a and b.

10. Is it possible to construct \( \triangle ABC \) with \( \angle A = 85^\circ \), AB = 7cm and \( \angle C = 95^\circ \)? Justify.

11. Solve for \( x : 3(x + 6) = 4(2x - 8) \)


13. If one side of a square is represented by \( 4x - 7 \) and the adjacent side is represented by \( 3x + 5 \), find the value of \( x \).

OR

Sunil is 8 yrs older than Anil. If the sum of their ages is 32 yrs, how old is each.
14. The area of a triangular flag with two equal sides is 2700 sqcm.
What is the perpendicular distance from the tip of the flag to the third side which is 60 cm in length?

15. Raghu went to attend a function at a senior club and there was a race competition between the senior citizens. They were running along the circular track of diameter 18 m. Raghu saw an old man running who got hurt but was trying very hard to finish the race.
(a) What was the distance the senior citizens had to cover.
(b) What is the value you learn from Raghu?

**Section C**

16. The length of the rectangle is 6m less than three times its breadth. If its perimeter is 148m, find the dimensions of the rectangle.

17. Mr Chawla took a loan from the bank of Rs 64000 at the rate of 11% p.a for three years at simple interest. How much interest and amount will he have to pay back after three years?

OR

Robert deposited Rs 12500 in a bank for three years. After 3yrs, he received Rs 15500 from the bank as the amount. What is the rate of interest he received from the bank?

18. Find \(x\) in the adjacent fig.
19. Draw the shape with the following
   (a) Rotational symmetry of order two.
   (b) No rotational symmetry.
   (c) An English alphabet with rotational symmetry of order 3.

20. ABCD is a rectangle and AC is one of its diagonals. Are the two triangles formed by the diagonal congruent? If so, give the proof and write the congruence of triangles in the correct correspondence. (Draw the required figure)

21. If \( \frac{7x + 5}{3} = -24 \), find the value of \( 3x - 4 \).

22. From a rectangular piece of metal sheet of length and breadth 1.60 m and 80 cm respectively, three circular sheets of 20 cm radius are cut out. Find the area of the metal left. (Use \( \pi = 3.14 \))

23. Construct \( \triangle XYZ \) in which \( XY = 7\, \text{cm} \), \( \angle X = 55^\circ \) and \( \angle Z = 35^\circ \). State the type of triangle formed.

24. In a triangle, the measures of the angles are \( x, (x + 20) \text{ and } 2x \). Find the value of \( x \).

25. Copy any one of the following figure on the graph paper and rotate it about the point C:

(90° Anticlockwise)

(180° Clockwise)
Section D

26. Mr Arun president of a housing society plans to construct a 1.5m wide footpath running all along the fence outside a park 40 m long and 30 m wide for all residents.
   (a) Find the perimeter of the fence and area of the footpath.
   (b) What values are displayed by Mr Arun. (Draw the required figure)

27. Construct $\Delta ABC$ in which $AC = 10\, \text{cm}, \angle A = 60^\circ$ and $\angle C = 30^\circ$. Measure the length of the side $AB$ and $\angle B$.

28. Arvind earns Rs 12000 per month. He spends 30% of his monthly income on house rent, 40% on household expenses, 5% on travel and donates 5% to an NGO for the education of street children. The remaining is saved in a bank.
   (a) Find out how much Arvind spends on each item and how much he saves.
   (b) What kind of a person is Arvind?

29. Two buildings of height 28m and 36m respectively are constructed on either side of the road. The distance between their tops is 17m. Find the width of the road.

30. In an isosceles triangle $ABC$ with $AB=AC$, $AD$ is the perpendicular from the vertex $A$ to $BC$. Prove that $AD$ bisects $\angle A$. (Draw the required figure)
Answers
Assignment - 1 (INTEGERS)
1. (a) -54  (b) -15  (c) multiple answers  (d) 35 degrees  (e) -20  (f) 45  (g) 17
3. (a) 50  (b) -1  (c) -650000  (d) 4116  (e) 300  (f) -2500
4. (a) -5600  (b) 3200  (c) 32m  (d) -3°C  (e) 7.30 sec  (f) 8.16  (g) 9.25m  (h) 10. Profit Rs 88000

Assignment - 2 (LINES and ANGLES)
1. z = 21°, x = 32°, y = 16°  2. a) linear pair  b) obtuse angle  c) 30°  d) 37°  e) 33°  f) 30°
g) non-parallel  h) 45°, 135°  3. 23°, 67°  4. 10°  5. x = 37°  7. 14°
8. ∠AOD = 60°, ∠AOC = 120°, ∠BOC = 60°, ∠BOD = 120°  10. 45°

Assignment - 3 (RATIONAL NUMBERS)
1. (a) -13/9  (b) -5/9  (c) -4  (d) 1 and -1  (e) 0  3. 2/3, 7/12, -5/6, -14/9
4. -5/36  5. -1/2  6(a) 9  6(b) 4/5  7. Angela, Sumit, Rohit
8. 14, No  9. 100  10. 100

Assignment - 4 (DATA HANDLING)
1. Mode = 31, Median = 27.5  5. (a) Yes, (b) 65.25 kg (c) No (d) No
6. (i) 11, (ii) (a) 1/11 (b) 2/11 (c) 4/11 (d) 7/11 (e) 0 (f) 1
7. 4, 6, 8, 9, 10, 12, 14, 15, 16, 18; Range = 14; Probability = 8/10 or 4/5
8. -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10; Median = 3.5; Probability = 7/14 or 1/2.
9. (a) 1/2 (b) 9/13  10(a) 1/13 (b) 1 (c) 1/4 (d) 3/4 (e) 1/2

Assignment - 5 (EXPONENTS AND POWERS)
1(a) No (b) Yes  2. 3^n  3. 0  4. 13  5(a) 625 (b) (n^2/3)^15 (c) 64/567 (d) 5^{a+b}  6. 6561
7(a) 6 (b) 3 (c) 3 (d) 0 (e) 1 (f) 2  8(a) 15 (b) 81  9. 1  10. 256

Assignment - 10 (PERIMETER AND AREA)
1. Area = 750 cm², AB = 37.5 cm  2. PM = 20 cm.  3. Area = 60 cm², PS = 7.06 cm
4. 12 m  5. 28 m  6. 30 m, 40 m  7. 84 m  8. Rs 780
9. Rs 14768  10 (a) 88 cm  (b) 308 sq cm  11. 264 cm².
Assignment – 7 (ALGEBRAIC EXPRESSIONS)
1. (a) \(-1, 7\) (b) \(1, 3, -4\) (3(a) \(3x^3 - 35y^3\) (3(b) \(-3a^2b - 14b^3\) (3(c) \(3x^2y^3 - 4x^3y^2\)
4. \(a = 4\) 5. \(20y - 2 - 11x - 5z^2\) 6. \(21m^2 + 11 - 19n^2\) (8(a) \(-9\) (8(b) \(-18\)
8(c) 2 8(d) 0 9(a) \(4a - 9b - 2c^2\) 9(b) \(b + c^2 - 5a\) 10. \(9x^2 + 11x + 6\)
11. \(6x^2 + x + 11\)

Assignment – 8 (TRIANGLES AND ITS PROPERTIES)
1. \(30^\circ, 30^\circ, 120^\circ\) 2. \(25^\circ, 75^\circ, 80^\circ\) 3. Each base angle = \(40^\circ\) 4. \(12\)m
5. \(8\)m 6. \(15\)m 7. \(\angle ACD = 70^\circ, \angle AED = 110^\circ\) 8. Yes
9. No 10. \(\angle P = 100^\circ, \angle Q = 40^\circ\)

Assignment – 9 (SIMPLE EQUATIONS)
PART-1
1. (a) \(x = 8\) (b) \(x = \frac{1}{5}\) (c) \(x = 1\) (d) \(x = 1\) (e) \(x = \frac{15}{61}\) (f) \(x = -2\)
(g) \(x = 4\) (2) \(-5\)

PART-2
1. \(24\) 2. \(30, 36, 42\) 3. \(15\) 4. \(58^\circ, 122^\circ\) 5. Length = \(30\)m, breadth = \(20\)m
6. RS \(180\)000 7. Ram’s age = \(32\)yrs, son’s age = \(8\)yrs 8. Total length of the pole = \(12\)m.
9. \(6\) yrs ago 10. \(12\) cm, \(12\) cm, \(4\) cm 11. \(33, 61\) 12. \(x = 10\)

Assignment – 11 (CONGRUENCE OF TRIANGLES)
1 (a) True (b) False (c) False (d) True (e) False 2. SAS Congruence
3. \(\triangle PQR\) 4. \(x = 73^\circ, y = 22^\circ\) 8. \(5\)cm 9. \(60^\circ\) 10. \(90\) cm

Assignment – 12 (COMPARING QUANTITIES)
1. \(26,100, 7830\) 2. \(61\frac{1}{4}\%\) 3. RS \(800\) 4. RS \(9900\) 5. RS \(75900\)
6. \(25\%\) 7. \(560\) 8. Raju, RS \(2160\) 9. RS \(15000\) 10. \(\frac{1}{4}\%\)