Brain International School

Vikas Puri, New Delhi

SUBJECT: MATHS **CLASS-VII** **TERM 2**

SIMPLE EQUATIONS

1. Write the following statements in the form of equations:
   (a) Seven times a number decreased by 4 gives 31.
   (b) Half of a number is 9 less than the number itself.
2. Write the following equations in statement form:
   (a) $4x + 9 = 29$
   (b) $6y - 5 = 13$
3. If $p - 6 = 12$, find the value of $5p - 18$.
4. Solve the following equation:
   $5(a - 3) = 2a + 4$
5. When 8 is subtracted from three times a number, the result is 19. Find the number.
6. The perimeter of an equilateral triangle is 36 cm. Find the length of each side.
7. Check whether the given value of variable is a solution or not:

   $\frac{y}{3} + 4 = 10$, for $(y = 18)$

THE TRIANGLE AND ITS PROPERTIES

1. Is it possible to draw a triangle with sides 6 cm, 8 cm and 15 cm? Give reason.
2. In a triangle, two angles are 45° and 55°. Find the third angle.
3. Two sides of a triangle are 7 cm and 10 cm. What can be the minimum length of the third side?
4. In Δ PQR, M is the midpoint of QR. Draw the figure and name the median of the triangle.
5. The exterior angle of a triangle is 110°. If one interior opposite angle is 40°, find the other interior opposite angle.
6. Find the value of x, if the angles of a triangle are $(2x + 10)°$, $(x + 20)°$ and $(x + 30)°$.
7. The diagonals of a rhombus are 16 cm and 12 cm. Find its perimeter.

8. Check which of the following can be the sides of the right-angled triangle:
   (a) (6, 8, 10)
   (b) (7, 24, 25)

COMPARING QUANTITIES

1. Find:
   (i) 25% of 360
   (ii) 12.5% of 80
2. Find the ratio of 2.4 kg to 800 g.
3. What percent of 2 m is 50 cm?
4. Convert into decimals and fractions in lowest term:
   (a) 18%
   (b) 0.75%
   (c) 62.5%
5. What percent of 50 is 12.5?
6. A shirt costs ₹1200. Its price is reduced by 10%. Find the new price.
7. Find the simple interest on ₹5000 at 8% p.a. for 3 years.
8. Riya scores 420 out of 500 and Aman scores 540 out of 650. Who performs better?
9. The price of a bag is increased by 20% to ₹1800. Find the original price.
10. Find the amount when ₹3000 is invested at 6% p.a. simple interest for 2 years.

RATIONAL NUMBERS

1. Reduce the following to standard form: $\frac{-28}{42}$
2. Represent the given rational numbers on number line: $\frac{5}{4}$ and $\frac{-3}{2}$
3. Find: $\frac{-7}{9} \times \frac{18}{21}$
4. Find the difference between $\frac{1}{2}$ and the sum of $\frac{3}{5}$ and $\frac{-7}{10}$.
5. Divide: $\frac{-6}{11} \div \frac{12}{22}$
6. Write the additive inverse of: $\frac{-4}{7}$.
7. Write the multiplicative inverse of: $\frac{-9}{5}$.
8. The product of two rational numbers is $\frac{-15}{16}$. If one number is $\frac{-3}{4}$, find the other.

ALGEBRAIC EXPRESSIONS

1. Identify the terms and coefficients:
   (i) $7x - 9$
   (ii) $4y^2 + 5y - 1$
2. Group the like terms:
   $5x, -3y, 2x^2, -7x, y, -x^2$
3. Classify into monomial, binomial and trinomial:
   (i) 9
   (ii) $x - 4$
   (iii) $x^2 + 3x - 5$
4. Draw a factor tree diagram for:
   (i) $6ab - 4$
   (ii) $x^2 - y^2$
5. Add:
   (i) $2x^2y, -4x^2y, 5x^2y$
   (ii) $a - 2b + 3, 2a + b - 1$
6. Simplify:
   (i) $a - (b - a) - b$
   (ii) $x^2 + 3x - x - 2x^2$
7. Subtract $(2x - y + 5)$ from $(5x + 3y - 2)$.
8. Simplify and find the value when $x = 3$: $3(2x - 1) - 4(x + 2)$

EXPONENTS AND POWERS

1. Express as powers of prime factors:
   (i) 196
   (ii) 400
2. Write in exponential form:
   (i) $2 \times 2 \times 2 \times 2 \times 2$
   (ii) $p \times p \times q \times q \times q$
3. Express as product of powers of prime factors:
   (i) 360
   (ii) 450
4. Write in expanded form:
   (i) 58,403
   (ii) 7,09,216

5. Find the number:
   (i) $4 \times 10^4 + 6 \times 10^2 + 9$
   (ii) $3 \times 10^5 + 2 \times 10^3 + 7$

6. Find the value:
   (i) $5^0 + 3^2$
   (ii) $(4^2 \times 4^3) \div 4^4$

7. Express in standard form:
   (i) 4,25,00,000
   (ii) 0.00082

8. Simplify using laws of exponents:
   $$\frac{12 \times 3^4 \times 2^5}{27 \times 4^2}$$

Assertion – Reason based questions

DIRECTION : In the question number 1 to 12, a statement of **Assertion (A)** is followed by a statement of **Reason (R)** . Choose the correct option.

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

Q1 Assertion (A): If (3x + 5 = 20), then the value of (x) is 5.

Reason (R): Subtracting the same number from both sides of an equation keeps it balanced.

Q2 Assertion (A): The equation (x + 7 = 12) has only one solution for x.

Reason (R): A linear equation in one variable has a unique solution.

Q3 Assertion (A): A triangle cannot be formed if the sum of two sides is equal to the third side.

Reason (R): For a triangle, the sum of the lengths of any two sides must be greater than the third side.

Q4 Assertion (A): The sum of the interior angles of a triangle is 180°.

Reason (R): A triangle can be divided into three straight angles.

Q5 Assertion (A): If CP and SP of the article are equal, then there is no profit or loss.

Reason (R): Profit or loss is calculated on the selling price, not on the cost price.

Q6 Assertion (A): A discount always reduces the selling price of an article.

Reason (R): Discount is the reduction given on the marked price.

Q7 Assertion (A): The product of two rational numbers is always a rational number.

Reason (R): Rational numbers are closed under addition.

Q8 Assertion (A): Every integer is a rational number.

Reason (R): Any integer can be written in the form $\frac{p}{q}$, where ($q \neq 0$).

Q9 Assertion (A): The expression (5x + 3y) is a monomial.

Reason (R): Terms in an algebraic expression are separated by addition or subtraction signs.

Q10 Assertion (A): The expression (4x - 2x) simplifies to (2x).

Reason (R): Like terms can be added or subtracted.

Q11 Assertion (A): ($2^3 \times 2^2 = 2^5$)

Reason (R): When multiplying powers with the same base, the exponents are subtracted.

Q12 Assertion (A): ($10^0 = 1$)

Reason (R): Any non-zero number raised to the power zero is equal to one.

📘 CASE-BASED QUESTIONS

CASE STUDY 1:

Riya dreams of buying a new storybook and starts saving money regularly. She already has ₹45 with her and decides to save ₹x every day. After saving for 5 days, her total money becomes ₹95. This situation helps us form a simple equation to find her daily savings.

Q1. Form the equation for the given situation.
Q2. Find the value of x.
Q3. How much money does Riya save in 5 days?
Q4. If Riya saves ₹12 per day, how much money will she have after 5 days including her initial amount?

CASE STUDY 2:

Four students stood by a long number line during Maths class. Aarav marked $\frac{-5}{6}$, standing far to the left, while Meera placed $\frac{-3}{4}$ just a little closer to zero. On the right side, Rohan showed $\frac{1}{2}$, and Siya proudly marked $\frac{2}{3}$, the farthest to the right. Together, they learned how rational numbers find their exact place on the number line.

Q1. Which of the given numbers is negative?

Q2. Which rational number lies farthest to the left on the number line?

Q3. Find the sum of $\frac{-3}{4}$ and $\frac{1}{2}$.

Q4. Find the multiplicative inverse of $\frac{2}{3}$.

CASE STUDY 3:

In a quiet computer lab, only 2 files sat neatly on the system on Day 1. Each day, the number of files doubled, growing faster than anyone expected. By the end of the week, the lab computers were buzzing with data. The students smiled, realizing how powerful exponential growth can be.

Q1. How many files are there on Day 3?

Q2. Write the number of files on Day 5 in exponential form.

Q3. Evaluate (2^6).

Q4. Simplify using laws of exponents: $2^3 \times 2^4$
