BRAIN INTERNATIONAL SCHOOL

SESSION 2024-25

CLASS: VIII ANNUAL REVISION SHEET SUBJECT: MATHEMATICS

LINEAR EQUATIONS IN ONE VARIABLE

1. Solve for x: 3x+7=16.

   (a) 2 (b) 3 (c) 5 (d) 9

2. If 2(x−3) = 10, what is the value of x?

   (a) 4 (b) 6 (c) 8 (d) 10

3. The perimeter of a rectangle is 50 cm. If the length is twice the breadth, find the dimensions of the rectangle.

4. Solve the following linear equations:

   (a) $6x + 7 = 19$

   (b) $x + \frac{7}{2} = 8x$

   (c) $\frac{7x}{4} - \frac{5x-1}{3} = \frac{5}{12}$

5. The difference between two positive numbers is 80 and the ratio of these integers is 1 : 3. Find the integers.

6. Saranya has 3 times as many two-rupee coins as she has five-rupee coins. If she has in all a sum of ₹77, how many coins of each denomination does she have?

7. A father's age is 3 times his son's age. If the sum of their ages is 48, find their ages.

8. The ages of A and B are in the ratio 4:5. Four years ago, the sum of their ages was 54. Find their present ages.

9. The numerator of a fraction is less than its denominator by 3. If the numerator becomes three times and the denominator is increased by 20, the new number becomes $\frac{1}{8}$. Find the original number

10. What should be subtracted from thrice the rational number $\frac{-11}{3}$ to get $\frac{13}{2}$?

SQUARE AND SQUARE ROOTS

1. What is the square root of 144?

   (a) 11 (b) 12 (c) 14 (d) 16

2. Which of the following is a perfect square?

   (a) 29 (b) 36 (c) 50 (d) 81

3. What is the square of 15?

   (a) 200 (b) 225 (c) 250 (d) 300

4. Find the square root of 169 by the method of repeated subtraction.

5. Is 625 a perfect square? If yes, find its square root.

6. Find the value of $\sqrt{45} \times \sqrt{20} \times \sqrt{441}$.

7. Write a Pythagorean triplet whose smaller member is 7. Justify your answer.

8. Without adding, find the sum: (1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17+ 19 + 21)

9. Write the unit digit of square of 1089.

10. A square garden has an area of 144 m². Find the side length of the garden. Also find the perimeter of the garden.

11. Find the smallest number by which 3645 should be multiplied so as to get a perfect square. Also, find the square root of the number so obtained.

12. What least number must be added to 2052 to make it a perfect square?

13. Evaluate:

(a) $\sqrt{12^2 + 5^2}$ (b) $\sqrt{100^2 - 80^2}$ (c) $\sqrt{\sqrt{25} + \sqrt{144} + \sqrt{64}}$

ALGEBRAIC EXPRESSION AND IDENTITIES

1. Which of the following is an algebraic expression?

(a) 5 + 3 (b) 3x + 5 (c) 7 (d) 5 × 3

2. Simplify: 5x + 3x − 2x

(a) 6x (b) 4x (c) 5x (d) 3x

3. What is the degree of the expression $4x^2 + 3x + 7$?

(a) 1 (b) 2 (c) 3 (d) 4

4. Simplify the expression: 7x + 4y − 3x + 2y.

5. If x = 3, find the value of $2x^3 + 5x - 8$.

6. If a = 4 and b = −5, evaluate $3a + 2b - a^2b$.

7. Expand and simplify (x + 3) (x + 4).

8. Twice a number when added to its square gives 35. Find the number.

9. Simplify the expression 2(x + 4) + 3(x − 5) and find its value at x = −2.

10. If 2x + 3y = 12, find the value of x when y = 2.

11. Subtract the sum of $3xy + 5$ and $2x^2y - 7xy + 3x$ from $x^2y + 4xy - 8$

12. Find the value of: $x^2 - \frac{1}{5}$ at x= −1.

13. Find the product of 9a, 4ab and −2a.

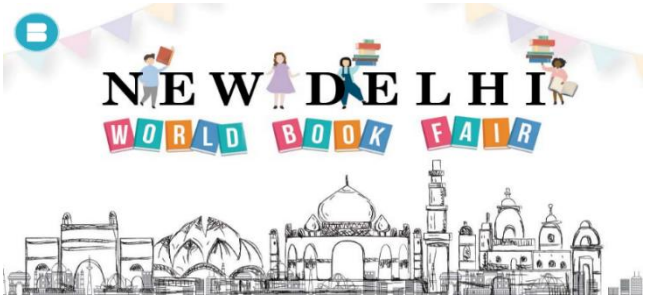
14. From the sum of $x^2 + 3x^2 y^2$ and $-3x^2 - 2y^2 - x^3y^2$, subtract the sum of $5x^2 - 4y^2$ and $-x^2 + 2x^3 y^2 - y$

15. If $P = 7a^2 - 2ab + 2b^2 - a^3 b^3$, $Q = a^3 b^3 + 8ab - 2b^2$ and $R = 3a^2 + 6ab + 3a^3 b^3$, find the value of $P + Q - R$.

16. The sum of two expressions is $8x^2 - 2xy^2 - 2x^2y + 4$. If one of them is $2x^2 + xy^2 - 9$, find the other.

17. **CASE STUDY BASED QUESTION**

The **New Delhi World Book Fair** is a significant event that celebrates the power of literature and attracts a diverse audience, offering a variety of books, publications, and journals. The fair aims to promote literacy, reading, and Indian literature across various subjects. Three friends Ram, Shyam and Tarun visited the book fair and purchased some books. The amount spent by Ram and Shyam was ₹ $(12xy + 4x^2 - 5y)$ and ₹ $(2xy - x^2 + 5y)$ respectively.



Based on the above information, answer the following questions:

(a)Find the amount spent by Ram if $x = 5$ and $y = 2$.

(b)Find the amount spent by Tarun if it equals the total amount spent by Ram and Shyam.

(c)The amount spent by Tarun is a binomial or trinomial. Justify the statement.

MENSURATION

1. The total surface area of a cube with side length 7 cm is:
   (a) 294 cm² (b) 343 cm² (c) 441 cm² (d) 392 cm²

2. The volume of a cylinder is 462 cm³, and its height is 7 cm. Find its radius.
   (a) 3 cm (b) 4 cm (c) 5 cm (d) 6 cm

3. Find the curved surface area of a cylinder with radius 5 cm and height 10 cm.

4. A cuboid has dimensions 8 cm by 6 cm by 4 cm. Calculate:
   (i) total surface area (ii) volume

5. A cylindrical tank has a radius of 3.5 m and a height of 6 m. Find:
   (i) the curved surface area (ii) the total surface area (iii) the volume of the tank

6. A cuboid has a length of 10 cm, width of 5 cm, and height of 8 cm. A cylinder has a radius of 5 cm and height of 8 cm. Compare the volume of the cuboid and the cylinder. Which one has a greater volume?

7. The diagonals of a rhombus are 10 cm and 24 cm. If the perimeter of the rhombus is 80 cm, find the area of the rhombus.

8. The area of a trapezium is 405 cm^2. Its parallel sides are in the ratio 4 : 5 and the distance between them is 18 cm. Find the length of each of the parallel sides.

9. The parallel sides of a trapezium are 25cm and 11cm, while its non-parallel sides are 15cm and 13cm. Find the area of the trapezium.

10. The volume of a rectangular tank is $132m^3$. If its length and breadth be 11m and 4 m respectively, find its depth.

11. Find the total surface area of the cube whose volume is $343cm^3$.

12. The dimensions of a room are 8m × 6m × 4m. Find the area of its four walls.

13. One side of a rhombus is 6.5 cm and the altitude is 4 cm. Find the area of the rhombus.

14. It costs ₹ 3300 to polish the inner curved surface of a cylindrical vessel 10 m deep. If it is polished at the rate of ₹20 per square metre, find the inner curved surface of the vessel. Also find its capacity.

EXPONENTS AND POWERS

1. What is the value of 4.05×10^6 in usual form?

(a)40500 (b)405000 (c)0.0000045 (d)4050000

2. Find the multiplicative inverse of:

(i) 23^{-5} (ii) 6^{-7}

3. Simplify the following and write in exponential form.

$$\left(\frac{4}{13}\right)^4 \times \left(\frac{13}{7}\right)^2 \times \left(\frac{7}{4}\right)^3$$

4. Simplify the following and write in exponential form.

(i) $(13^2 \div 13^5)^4 \times 13^{-14}$ (ii) $\frac{1}{64} \times 6^{-3}$

5. If $\frac{x}{y} = \left(\frac{5}{2}\right)^{-2} \div \left(\frac{5}{7}\right)^0$, find the value of $\left(\frac{x}{y}\right)^{-4}$

6. Find the value of x if

$$\left(\frac{2}{5}\right)^{2x+6} \times \left(\frac{2}{5}\right)^3 = \left(\frac{2}{5}\right)^{x+2}$$

7. Solve the following: $(81)^{-4} \div (729)^{2-x} = 9^{4x}$

8. Simplify:

$$\frac{(-2)^3 \times (-2)^7}{3 \times 4^6}$$

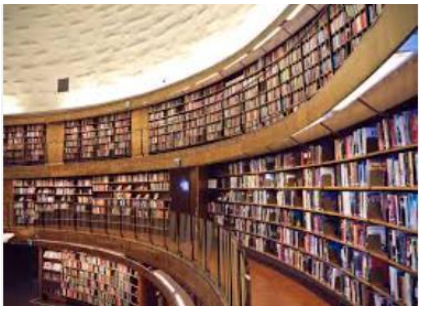
9. Find x so that $(-5)^{x+1} \times (-5)^5 = (-5)^7$

10. Express in standard form: a) 3080000 b) 0.00067

11. By what number should $(-8)^{-3}$ be multiplied so that the product may be equal to -6^{-3}?

12. **CASE STUDY BASED QUESTION**

In a library, books of different subjects and various fields are kept for the general public. In a stack there are 5 books each of thickness 20mm and 5 paper sheets each of thickness 0.016 mm.



Based on the above information, answer the following questions:

a) What is the thickness of 5 such books in cm?

b) What is the thickness of 5 paper sheets in mm? Express the answer in scientific notation.

c) What is the total thickness of the stack?

DIRECT AND INVERSE PROPORTIONS

1. If y is directly proportional to x, which of the following is true?
   (a) y= x (b) y=kx (c) $y=x^2$ (d) y=k/x
2. If y is inversely proportional to x, what is the equation?
   (a) y=kx (b) y=k/x (c) $y=x^2$ (d) y=k+x
3. If x and y are in direct proportion, what happens to y when x is doubled?
   (a) y is doubled (b) y is halved (c) y remains constant (d) y is quadrupled
4. If 6 workers can complete a task in 8 days, how many days will 12 workers take to complete the same task?
   (a) 16 days (b) 4 days (c) 8 days (d) 12 days
5. Complete the table if x and y vary directly.

x	3.5	4	7.5	–
y	–	8	–	15

6. If y is directly proportional to x, and y=10 when x=5, find y when x=15.
7. The scale of a map is given as 1:25,000. Two villages are 5 cm apart on the map. Find the actual distance between them.
8. If the mass of 56 sheets of paper is 280g, how many sheets will weigh 6 kg?
9. If 28 pumps can empty a reservoir in 15 hours, how long will 35 pumps take to do the same work?
10. A car is travelling at the average speed of 50 km/hr. Find its speed in metre/second. How much distance would it travel in 1hour 12 minutes?
11. A school needs 15 teachers to teach 450 students. How many teachers are required to teach 900 students if the number of students per teacher remains constant?
12. A car travels 100 km in 2 hours. How long will it take to travel 150 km at the same speed?
13. A recipe requires 5 cups of flour to make 10 cakes. How many cups of flour are needed to make 50 cakes?

14. **CASE STUDY BASED QUESTION**: A family uses water for different purposes as shown in the table below:

Purpose	Water Used per Day (liters)
Drinking	10
Cooking	20
Cleaning	50
Gardening	40

Based on the above information, answer the following questions:

(a) Find the total consumption of water per day by the family if current family has 4 members?

(b) If the family's daily water consumption is proportional to the number of members, how much water would a family with 6 members use in a day?

(c) If the family reduces its water usage for gardening by 25%, how much water will they save per day?

FACTORISATION

1. Factorize: x^2-9

(a) $(x-3)(x+3)$ (b) $(x-2)(x+2)$ (c) $(x-4)(x+4)$ (d) $(x+1)(x-1)$

2. Which of the following is the correct factorization of $x^2 + 7x+12$?

(a) $(x+4)(x+3)$ (b) $(x+2)(x+6)$ (c) $(x-3)(x+4)$ (d) $(x-2)(x+5)$

3. Which of the following is the factorization of $2x^2 + 8x$?

(a) $2x(x+4)$ (b) $2x(x-4)$ (c) $x(x+4)$ (d) $2(x+4)$

4. Factorise:

a. $3a + 9b - 3(a+3b)^2$ b. $x^2 + 14x + 49$ c. $9y^2 - 36zy + 36z^2$

d. $ab - mn + an - bm$ e. $(12m^2 - 27)$ f. $196x^2 - 81$

g. $54m^3n + 81m^4n^2$ h. $4p^2 + 2q^2 + p^2q^2 + 8$ i. $14(3y - 5z)^3 + 7(3y - 5z)^2$

j. $x^4 - (x - y)^4$ k. $(x + y)^2 - 4xy - 9z^2$ l. $x^2 - y^2 - 2y - 1$

5. Solve:

a. $(4x^2 - 100) \div 6(x + 5)$ b. $(10x^3y^2z^2 + 10x^2y^3z^2 + 20x^2y^2z^3) \div 10x^2y^2z^2$

c. $12(y^2 + 7y + 10) \div 3(y + 2)$ d. $(3b - 6a) \div (30a - 15b)$

e. $44(p^4 - 5p^3 - 24p^2) \div 11p(p - 8)$ f. $15(y + 3)(y^2 - 16) \div 5(y^2 - y - 12)$.

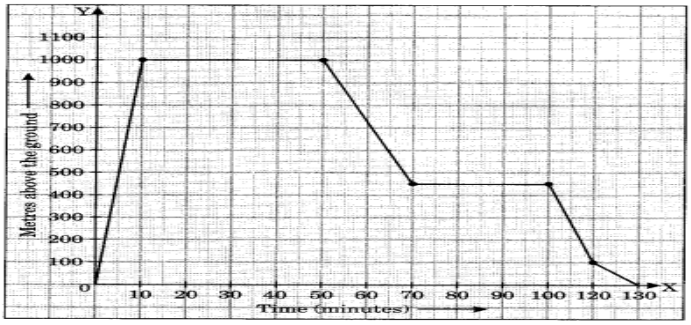
6. Find the value of $(98.6)^2 - (1.4)^2$ using suitable identity.

INTRODUCTION TO GRAPHS

1. Draw the graph of the following table. Is it a linear graph?

x	3	4	5	6	7
y	12	16	20	24	28

2. The given graph shows the flight of an aeroplane.



(i) What are the scales taken on x-axis and y-axis?

(ii) Up to what height did the aero plane rise?

(iii) What was the speed of the aero plane while rising?

3. The following table shows the number of cars sold by a car dealer during March'24 to August'24. Draw a line graph for the following data:

Month	March	April	May	June	July	August
No. of cars sold	5	2	4	10	4	6

4. Draw the linear graph for the following table of values of time (in hours) and distances (in km) covered by a car.

Time (in hours)	7:00	8:00	9:00	10:00
Distance (in km)	60	120	180	240

From the graph, find:

(i) The distance covered by the car during the period 7:00 to 8:00.

(ii) At what time the car would have covered 210 km?

ASSERTION AND REASONING BASED QUESTIONS

DIRECTION: In the question 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 but Reason is not a correct explanation of Assertion.

(c) Assertion is true and Reason is false

(d) Assertion is false and Reason is true.

(1) **Assertion (A)**: The solution of $2x+5=15$ is $x=5$.

Reason (R): Subtracting 5 from both sides and then dividing by 2 gives the solution.

(2) **Assertion (A):** The square of any odd number is always odd.

Reason (R): When an odd number is multiplied by itself, the product is always odd.

(3) **Assertion (A)**: If two quantities are in direct proportion, their ratio remains constant.

Reason (R): Direct proportion means that the product of the two quantities is constant.

(4) **Assertion (A)**: The product of a monomial and a binomial is always a trinomial.

Reason (R): The distributive property is used to multiply a monomial with a binomial.

(5) **Assertion (A)**: $(2^3)^4 = 2^{12}$

Reason (R): When a power is raised to another power, the exponents are multiplied.

(6) **Assertion (A):** The total surface area of a cylinder of base radius r and height h is $2\pi r (r + h)$.

Reason (R): The surface area formula is a mathematical solution to find the total area of any three-dimensional object occupied by all of its surfaces.