DATA HANDLING

1. The height of a rectangle in a histogram shows the ________________________

2. A geometric representation showing the relationship between a whole and its parts is a ________________________

3. In a pie chart, the total angle at the center of the circle is _____________

4. What is the probability of choosing a vowel from the alphabet ________________

5. The number of times a particular observation occurs in a given data is called its ______

6. In a throw of dice, the probability of getting the number 7 is _________________

7. Upper limit of class interval 75-85 is ________________

8. Size of the class 150-175 is _____________

9. The range of the data 6,8,22,8,20,7,25 is ________________

10. An experiment whose outcomes cannot be predicted exactly in advance is called a ________________________ experiment.

11. Various modes of transport used by students of a school are given below

<table>
<thead>
<tr>
<th>School bus</th>
<th>Private bus</th>
<th>Bicycle</th>
<th>Rickshaw</th>
<th>By foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>640</td>
<td>360</td>
<td>490</td>
<td>210</td>
<td>150</td>
</tr>
</tbody>
</table>

Draw a bar graph to represent the above data.

12. The marks obtained by 40 students of a class in an examination are given below:
8,47,22,31,17,13,38,26,3,34,29,11,22,7,15,24,38,31,21,35,42,24,45,23,21,27,29,49,25,48,21,15,18,27,19,45,14,34,37,34

Prepare a frequency distribution table of class size 10

13. The heights (in cm) of 22 students were recorded as:
125,132,138,144,142,136,134,125,135,130,126,132,135,142,143,128,126,136,135,130,130,133

Prepare a frequency distribution table of equal class interval. Draw a histogram from the given data.

14. Draw a histogram for the following data

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>10-15</th>
<th>15-20</th>
<th>20-25</th>
<th>25-30</th>
<th>30-35</th>
<th>35-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>30</td>
<td>98</td>
<td>80</td>
<td>58</td>
<td>29</td>
<td>50</td>
</tr>
</tbody>
</table>

15. The following data represents the number of animals in a zoo. Prepare a pie chart for the given data

<table>
<thead>
<tr>
<th>Animals</th>
<th>Number of animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer</td>
<td>42</td>
</tr>
<tr>
<td>elephant</td>
<td>15</td>
</tr>
<tr>
<td>giraffe</td>
<td>24</td>
</tr>
<tr>
<td>reptiles</td>
<td>21</td>
</tr>
<tr>
<td>tiger</td>
<td>18</td>
</tr>
</tbody>
</table>
16. A survey was carried out to find the favorite subjects preferred by a certain group of students. The following pie chart shows the findings of this survey. From this chart answer the following:

(i) Which subject is liked by the maximum number of students?
(ii) If 45 students like English, how many students were surveyed?
(iii) Find how many students like each subject?

17. The following table shows the expenditure in percentage incurred on the construction of a house in a city.

<table>
<thead>
<tr>
<th>Item</th>
<th>brick</th>
<th>cement</th>
<th>Steel</th>
<th>labour</th>
<th>others</th>
</tr>
</thead>
<tbody>
<tr>
<td>expenditure</td>
<td>15%</td>
<td>20%</td>
<td>10%</td>
<td>25%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Represent the above data by a pie chart.

18. The pie chart shows the monthly expenditure of a family. Read the pie chart and answer the following questions.

(i) What is the central angle for rent?
(ii) If the family spends Rs. 2100 on rent, then what is the total monthly income?
(iii) What percentage of the total monthly income does the family save?
(iv) What is the difference in rupees on amount spending on food and others?

19. From a well-shuffled deck of 52 cards, one card is drawn random. What is the probability that the drawn card is

(i) a queen (ii) a black 6 (iii) a red card (iv) an ace (v) an even numbered card (vi) ace of heart (vii) a spade
1. The solution of \( \frac{x}{5} - 1 = \frac{3}{5} \) is ...... 

2. Two numbers are in the ratio 3:4, differ by 20, the numbers are........

3. The ratio of the number of notes of Rs.5 and Rs.10 is 1:2. If the total amount is Rs 100, the total number of notes is ..............

4. The value of \( m \) in \( 0.25 = \frac{4}{m} \) is ................

5. \( \frac{3}{10} a - \frac{3}{10} = \frac{3}{10}, a = \) ...........

6. \(-P(P - 1) = -(1 - P) \); \( P = \)......

7. \( \frac{7t}{9} = \frac{14}{33} \); \( t = \)...........

8. A number multiplied by its reciprocal and the product is added to twice the additive inverse of the number, the sum equals \( \frac{1}{2} \) less than the number. The number is ...........

9. Ten years from now Seema's age will be two less than 5times her present age. Her present age is ..............years.

10. **SOLVE THE FOLLOWING:**

   a) \( 7a-6 = 3a-10 \) 
   b) \( \frac{4m-1}{4} - 3 = \frac{7m-2}{2} \) 
   c) \( 0 = 12(2y-3) - 3(6+5y) + 3(y+2) \)

   d) \( 6p + \frac{4}{3} = \frac{7}{2} p - 6 \) 
   e) \( \frac{6a-1}{2} = \frac{a+6}{3} \) 
   f) \( -3(2a-5) - 2(3a+11) = -5(a-2) + 4 \)

   g) \( \frac{12}{5} - 5x = 4 \) 
   h) \( 7z + \frac{3}{7} = \frac{11}{7} - z \)
   i) \( \frac{-7}{10} - \frac{2+5x}{5} = -2 - \frac{3x-2}{10} \)

   j) \( \frac{5m}{6} - 2 = \frac{5m}{12} - \frac{7}{6} \) 
   k) \( x - \frac{x-3}{3} = 1 - \frac{x-1}{4} \)
   l) \( \frac{2z-3}{7} - \frac{3z-4}{14} = \frac{5}{7} - \frac{5z}{14} \)

   m) \( \frac{2x-1}{3x-5} = \frac{-1}{2} \) 
   n) \( 4(5-2x) = 3x + 9 \)
   o) \( \frac{2m+5}{3} = \frac{3-5m}{6} = \frac{1}{2} - m \)

   p) \( y = -\frac{7}{9}(y + 2) \) 
   q) \( 3.2(3 - 5x) = 0.2(8 - 5x) \)
   r) \( \frac{-2a}{6-5a} = \frac{4}{7} \)

   s) \( 0.04(100 - 5g) = 1.2(1.5g - 50) \)
11. What should be subtracted from twice the rational number \( \frac{-3}{11} \) to get \( \frac{-5}{22} \)?

12. The sum of 3 consecutive multiples of 17 is 306, find the multiples.

13. I have a total of Rs 1000 with denomination of Rs 50 and Rs 100 notes. Find the number of notes in each denomination, if the total number of notes is 15.

14. Three consecutive odd numbers taken in descending order are multiplied by 2, 4 & 6 respectively and the products add up to 124. Find the numbers.

15. A rational number is multiplied by \( \frac{3}{7} \) and add \( \frac{7}{3} \) to the product, the sum is \( \frac{4}{3} \). What is the number?

16. Sum of two numbers is 200. If one of the numbers is three times the other, find the numbers.

17. Sum of 3 consecutive integers is 900. Find the integers.

18. When we multiply \( \frac{-5}{9} \) with the sum of a rational number and \( \frac{-7}{15} \), we get \( \frac{-1}{9} \). Find the number.

19. The ages of Teena & Tinsa are in the ratio 3:2. Six years later, Teena’s age will be 9 less than three times the present age of Tinsa. What are their present ages?

20. The present age of Aleena’s father is 16 less than 3 times her present age. After 4 years the sum of their ages will be 80 years. Find their present ages?

21. The ratio of 2 numbers is 3:7 and the difference between them is 120. Find the numbers?

22. Nayana has a total of Rs.25000 as currency notes in the denomination of Rs. 100, Rs. 500 and Rs.1000. The ratio of the numbers of Rs.500 notes and Rs.1000 notes is 2:1.If she has a total of 80 notes, how many notes of each denomination she has?

23. Nimisha has an amount Rs. 340 in coins of denomination Re.1, Rs.2 and Rs.5. The numbers of Rs.5 coins is 10 more than the numbers of Rs.2 coins. If the total number of coins is 100, find the numbers of coins of each denomination.

24. The digits of a 2 digit numbers differ by 5, if the digits are interchanged and the resulting number is added to the original number, we get 121. What is the original number?

25. One of the two digits of a 2 digit number is 4 times the other digit. If you interchange the digits of this two digit number and the resulting number is added to the original number you get 110. What is the original number?

26. Sum of the digits of a 2 digit number is 7. When the digits are reversed, the resulting new number is less than the original number by 45. Find the two digit number.
27. One of the two digits of a two digit number is 8 more than the other. If the digits are interchanged and add the resulting new number to the original number the sum is 110. Find the original number?

28. The numerator of a rational number is less than its denominator by 5, if the numerator is increased by 1 and denominator is decreased by 2, the number obtained is \(\frac{2}{3}\). Find the rational number?

29. The denominator of a Rational number is 4 more than its Numerator, if the numerator is decreased by 3 and the denominator is doubled, the number obtained is \(\frac{-1}{5}\). Find the Rational number?

30. Raj is four years younger than Rani. Seven years ago, Raj’s age was one third of Rani’s age. What are their present ages?

31. The sum of the ages of Amal and his father is 50 years. After 10 years, father will be 10 years more than 2 times the age of his son. Find their present ages?

32. The ages of Sunitha and Rasheeda are in the ratio 7:8. Ten years from now the ratio of their ages will be 9:10. Find their present ages?

33. Arun’s mother is 3 times as old as Arun at present. 9 years ago she was 5 times that of his age. What are their present ages?

34. The perimeter of a rectangle is 140m. If the length is 10 meter more than 5 times its breadth, Find the dimensions of the rectangle.

35. Consider a number. Subtract \(\frac{1}{2}\) from its reciprocal and multiply the difference with twice the number, you get the same number. Find the number.
1. Find the area of the trapezium whose parallel sides are 16 cm and 22 cm long and the distance between the parallel sides is 12 cm?

2. Area of a trapezium is 144 cm² and its height is 12 cm. If one of the parallel sides is two times the other, find the two parallel sides?

3. A room is 10 m long, 5 m wide and 2 m high. It has 2 doors 2 m x 1 m and 4 windows 1 m x 1 m. Find the cost of white washing its walls and ceiling at the rate of ₹7/m²?

4. The area of a trapezium is 303 cm² and the length of one of the parallel sides is 16.4 cm. If the height is 1.5 dm, find the other parallel sides?

5. The ratio of the lengths of the parallel sides of a trapezium is 5:3. The distance between them is 16 cm. If the area of the trapezium is 960 cm², find the lengths of the parallel sides?

6. The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. How many litres of water can it hold?

7. The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. Find the ratio of their volumes?

8. How many bricks are required to construct a wall 10 cm long, 4 dm wide and 3 m high if each brick measures 25 cm x 12 cm x 8 cm?

9. The lateral surface of a hollow cylinder is 5220 cm². It is cut along its height and formed into a rectangular sheet of width 36 cm. Find the perimeter of the rectangular sheet?

10. A box which measures 70 cm x 36 cm x 12 cm is to be covered with canvas. How many metres of canvas of width 80 cm would be required to cover 150 such boxes?

11. The shape of a garden is as shown in the fig. It is rectangular in the middle and semicircular at the ends. Find the area and perimeter of this garden?

12. Siddarth is painting the ceiling and walls of a cuboidal room with length, breadth and height of 20 m, 12 m and 10 m respectively. An area of 80 m² can be painted from each can. Find how many cans of paint will be required to paint the room?
13. CSA of a right circular cylinder of height 14 cm is 924 cm$^2$. Find the radius of its base?
14. Find the cost of painting a wooden box which is in the shape of a cube of side 17 cm at the rate of 50 paisa per square cm.
15. The length of one of the diagonals of a field in the form of a quadrilateral is 42 m. The perpendicular distances of the other two vertices from this diagonal are 12 m and 9 m. Find the area of the field?
16. Find the area of a rhombus whose diagonals are 8 cm and 14 cm long.
17. Find the area of a rhombus whose side is 8 cm and whose altitude is 5 cm. If one of its diagonals is 10 cm long, find the length of the other diagonal.
18. The floor of a rectangular hall has a perimeter of 250 m. If its height is 6 m, find the cost of painting its four walls at the rate of Rs. 20 per m$^2$.
19. Find the capacity in litres of a cylindrical vessel open at the top whose diameter is 8.4 cm and depth is 20 cm.
20. The radius and height of a cylinder are 14 cm and 51 cm respectively. Find the volume, CSA and TSA of the cylinder.
21. A rectangular water reservoir contains 24000 litres of water. The reservoir is 8 m long and 3 m wide. Find the height of water in the reservoir.
22. Find the surface area of a cube whose volume is 19683 m$^3$.
23. What will happen to volume of a cube, if its edge is (a) doubled? (b) Halved? (c) Tripled?
24. A floral design on the floor of a building consists of 280 tiles. Each tile is in the shape of a parallelogram of height 3 cm and base 5 cm. Find the cost of polishing the design at Rs. 1.50 per sq. cm.
25. A figure is in the form of a quadrilateral ABCD. Its area is 165 sq.cm. Find the length of the perpendicular drawn from D on AC if AC = 15 cm and length of perpendicular from B on AC is 12 cm.
26. Find the ratio of the TSA of cylinder to its CSA, given that its height and radius are 7.5 cm and 3.5 cm, respectively.
27. Find the LSA, TSA and volume of a cube whose edge is 9 m.
28. The total surface area of a cube is 1350 m$^2$. Find its volume.
29. Find the cost of plastering a well with radius 2 m and depth 14 m @ Rs. 23 per m$^2$.
30. The area of a rectangular playground is 4800 m$^2$. Find the cost of covering it with gravel 1 cm deep, if the gravel cost Rs. 260 per cubic meter.
CHAPTER 12: EXPONENTS AND POWERS

1. Write the following numbers in usual form:
   (a) 3.95 \times 10^6  (b) 3.007 \times 10^5  (c) 2.05 \times 10^{-6}

2. Find the multiplicative inverse of: (a) 7^{-4}  (b) 3^{-3}  (c) 2^{-5}

3. Express each of the following in standard form: (a) 0.000007  (b) 0.000000088

4. Evaluate the following: (a) \frac{3}{4}^2 \times \frac{3}{4}^2  (b) (-1/3)^2 \times (-1/3)^{-2}  (c) \frac{3}{5}^3 \times \frac{5}{3}^3
   (d) (-1/2)^4 \times (-2/3)^3  (e) (-2/5)^7 \div (-2/5)^4

5. Evaluate: (a) \left(2^{3\times 2}\right)^2 \times 2^5  (b) \left(-3\right)^5 \times (-3)^{3^2}  (c) 2^6 \times 2^5 \times 2^4  (d) m^8 \times m^6 \times m^5

6. Find the value of the following: (a) (3^0 + 3^3) \times 3^2  (b) (3^3 \times 6^1) \div 3^2  (c) (2^{-1}+3^{-1}+4^{-1})^0
   (d) \left(\frac{1}{3^2}\right)^3

7. Evaluate: (a) 81^{3/4}  (b) 27^{1/3}  (c) \left(27/64\right)^{1/3}  (d) \left(64\right)^{2/3}

8. Simplify: (a) \left(x^4\right)^2  (b) \left(3x^2\right)^0 \times \left(xy\right)^2
   (c) 49x \times p^{-4}  (d) 27 \times a^6
   \[7^3 \times 14 \times p^{-8}\]  \[12 \times 4^3 \times a^5\]

9. Find the value of \(x\) for which:
   (a) \left(-3/4\right)^{1/2} \times \left(-3/4\right)^3 = \left(4/3\right)^x  (b) 7^{10} \div 7^6 = \left(1/7\right)^x
   (c) 2^{2x-2} = 2^{3x-1}  (d) 64^{3x-5} = 4 \times 8^{x-4}
MCQ’s
1. 40% of \(100 - 20\%\) of 300 is equal to
(a) 20  (b) 16  (c) 140  (d) 64
2. The compound interest on Rs 50,000 at 4% per annum for 2 years compounded annually is
(a) Rs 4,000  (b) Rs 4,080  (c) Rs 4,280  (d) Rs 4,050
3. If marked price of an article is Rs 1,200 and the discount is 12% then the selling price of the article is
(a) Rs 1,056  (b) Rs 1,344  (c) Rs 1,212  (d) Rs 1,188
4. The marked price of an article is Rs 80 and it is sold at Rs 76, then the discount rate is
(a) 5%  (b) 95%  (c) 10%  (d) appx. 11%
5. If 90% of \(x\) is 315 km, then the value of \(x\) is
(a) 325 km  (b) 350 km  (c) 350 m  (d) 325 m

True or false
1. Discount is a reduction given on cost price of an article.
2. Sales tax is always calculated on the cost price of an item and is added to the value of the bill.
3. Simple interest on a given amount is always less than or equal to the compound interest on the same amount for the same time period and at the same rate of interest per annum.
4. A man purchased a bicycle for Rs 1,040 and sold it for Rs 800. His gain per cent is 30%.

Solve
1. Find the S.P. if
(a) M.P. = Rs 5450 and discount = 5%
(b) M.P. = Rs 1300 and discount = 1.5%
2. Find the discount in per cent when
(a) M.P. = Rs 625 and S.P. = Rs 652.50
(b) M.P. = Rs 900 and S.P. = Rs 873

Word Problems
1. The marked price of an article is Rs 500. The shopkeeper gives a discount of 5% and still makes a profit of 25%. Find the cost price of the article.
2. In the year 2001, the number of malaria patients admitted in the hospitals of a state was 4,375. Every year this number decreases by 8%. Find the number of patients in 2003?
3. A watch worth Rs 5400 is offered for sale at Rs 4,500. What per cent discount is offered during the sale?
4. In 1975, the consumption of water for human use was about 3850 cu. km/year. It increased to about 6000 cu. km/year in the year 2000. Find the per cent increase in the consumption of water from 1975 to 2000. Also, find the annual per cent increase in consumption (assuming water consumption increases uniformly).
5. Babita bought 160 kg of mangoes at Rs 48 per kg. She sold 70% of the mangoes at Rs 70 per kg and the remaining mangoes at Rs 40 per kg. Find Babita’s gain or loss per cent on the whole dealing.
6. Find the difference between Compound Interest and Simple Interest on Rs 45,000 at 12% per annum for 5 years.

7. Lemons were bought at Rs 48 per dozen and sold at the rate of Rs 40 per 10. Find the gain or loss per cent.

8. A new computer costs Rs 1,00,000. The depreciation of computer is very high as new models with better technological advantages are coming into the market. The depreciation is as high as 50% every year. How much will the cost of computer be after two years?

9. Ashima sold two coolers for Rs 3,990 each. On selling one cooler she gained 5% and on selling the other she suffered a loss of 5%. Find her overall gain or loss % in whole transaction.

10. On selling a chair for Rs 736, a shopkeeper suffers a loss of 8%. At what price should he sell it so as to gain 8%?

11. A lady bought an air-conditioner for Rs 15,200 and spent Rs 300 and Rs 500 on its transportation and repair respectively. At what price should she sell it to make a gain of 15%?

12. During school hours, Neha finished 75% of her homework and Minakshi completed 5/8 of her homework. Who must finish a greater per cent of homework?

13. The human body is made up mostly of water. In fact, about 67% of an adult's total body weight is water. If Jyoti weighs 56 kg, how much of her weight is water?

14. At a toy shop price of all the toys is reduced to 66% of the original price. (a) What is the sale price of a toy that originally costs Rs 90? (b) How much money would you save on a toy costing Rs 90?

15. A dining table is purchased for Rs 3,200 and sold at a gain of 6%. If a customer pays sales tax at the rate of 5%, how much does the customer pay in all for the table?

16. Given the principal = Rs 40,000, rate of interest = 8% p.a. compounded annually. Find (a) Interest if period is one year. (b) Principal for 2nd year. (c) Interest for 2nd year. (d) Amount if period is 2 years.

17. Rahim borrowed Rs 10,24,000 from a bank for one year. If the bank charges interest of 5% per annum, compounded half-yearly, what amount will he have to pay after the given time period. Also, find the interest paid by him.

18. In how much time will a sum of Rs 1,600 amount to Rs 1,852.50 at 5% per compound interest?

19. Find the amount and compound interest on Rs. 10,000 for one and a half years at 10% p.a. compounded half yearly?

20. Shankar buys a motorcycle for Rs. 12,960 including sales tax. If the rate of sales tax is 8%, what is the sale price of the motorcycle?
GRADE: VIII

1. Identify the terms and coefficients of each of the following:
   a) \(8a^3cd - 6cd\)  
   b) \(p^3 - 6p + 3\)  
   c) \(9x^2y^2 - 5x^2y + 3y\)  
   d) \(\frac{1}{2} a - 1/3 b + 10ab\)

2. Classify the following polynomials as monomials, binomials and trinomials:
   a) \(12xy + 3x - 2y\)  
   b) \(-7/8p^2q^2r\)  
   c) \(15abc - 12\)  
   d) \(9a^3x^2 - 8x^2 + 15\)

3. Add the following algebraic expressions:
   a) \(X + 2y - 3z\), \(-3x + y + 2z\) and \(2x - 3y + z\)
   b) \(3xy^2 - 2y^2 + x^2\), \(5x^2y - xy^2 - 3x^2\), \(8x^2 + 5y^2\) and \(9x^2y - 2x^2 + xy^2\)
   c) \(20a + b - c\), \(a - 20b + c\) and \(a + b - 20c\)
   d) \(3x^2 + 2xy - 4y^2\), \(x^2 - 2xy + 3y^2\) and \(2x^2 + xy - 5y^2\)

4. Subtract:
   a) \(-8x^2\) from \(9x^2\)
   b) \(4x - 3y + 5z\) from \(3x - 2y + z\)
   c) \(x^2 - x + 1\) from \(-2x^2 - x^2 - 3x + 2\)
   d) \(a^3 + b^3 - c^3 - 3abc\) from \(7abc - 3a^2 + 5b^2 - c^3\)

5. Subtract \(4x - 6x^2 + 2x^3\) from the sum of \(5 + 7x^2 + 5x^3\) and \(10 + 8x^2 - x^3\)

6. Simplify the following:
   a) \(13a - 5a^2 - (13a - 5a^2)\)
   b) \(7x - 5y - (4x - 2y) - (3x - 3y)\)

7. What must be added to \(16a^2b + 8ab^2 - 14a^2b^3 - b^4\) to get \(10a^2b - 5ab^2 - 7a^2b^3\)?

8. Find the perimeter of a rectangle whose adjacent sides are \(5x^2 - 6y + 8\) and \(12x^2 + 8y - 9\).

9. A girl solves \(10p^2 - 7q + 3\) problems out of which only \(11q - 6q^2 - 1\) are correct. How many problems are wrong?

10. Find each of the following products:
    a) \(-3x^2 \times 7x^5\)
    b) \(4a^2b^3c \times 7a^2b^4c^2\)
    c) \(-8/5 x^4y^2z \times -15/4 x^2y^2z^2\)
    d) \(2/3p^3q^2r \times 9/4pqr\)

11. Find the product and verify the result when \(x = -1, y = 1\) and \(z = -2\)
    a) \(-9yz \times 4/5 xyz^2 \times -25/3 x^2y^3\)
    b) \(-6/11 xyz^2 \times -22/21 xyz \times 7x^4 y^2z^2\)

12. Multiply:
    a) \(-x^3y\) and \(x^2 + y^2 - z^2\)
    b) \(0.5y\) and \(0.1x^3 + 0.1y\)
    c) \(7/5 x^3y\) and \(2x/5 + 3/5 xy^2\)
    d) \(3x + 2y\) and \(9x^2 + 4y^2\)

13. Show that \((a - b)(a + b) + (b - c)(b + c) + (c - a)(c + a) = 0\)
14. Subtract \(3x(x + y + z) - 2y(x - y + z)\) from \(4z(-x + y + z)\)

15. Subtract \(3a(a - b + c)\) from \(4a(2c - a - b)\)

16. Simplify: \(2ab(a + b) - 3ab(a - b)\) and find its value when \(a = 1, b = -2\)

17. If \(x + 1/x = 6\), find the value of \(x^2 + 1/x^2\)

18. Using suitable identity, find the product of each of the following:

   a) \((x + 4)(x + 4)\)  
   b) \((2x + 3)(2x + 3)\)  
   c) \((3y - 2x)(3y - 2x)\)  
   d) \((2a - 3b)(2a - 3b)\)  
   e) \((6x + 5)(6x - 5)\)  
   f) \((5x + 2y)(5x - 2y)\)  
   g) \((x + 3)(x + 5)\)  
   h) \((5x - 7)(5x + 2)\)  
   i) \((4p + 5)(4p - 7)\)  
   j) \((2m - 5)(2m - 3)\)  
   k) \((11l + 9n)(11l - 8n)\)  
   l) \((6k - 3)(6k - 1)\)

19. Find the square of the following using suitable identities.

   a) \((xy + z)^2\)  
   b) \((a - 2b)^2\)  
   c) \((3p + 2q)^2\) \((3p - 2q)^2\)  
   d) \((2x/3 + 5)(2x/3 - 3)\)  
   e) \((pq + r)^2\)  
   f) \((5x - 4z)^2\)  
   g) \((10s + 8t)(10s - 8t)\)  
   h) \((5pq/4 - 5)(5pq/4 - 2)\)

20. Using appropriate identities, evaluate the following:

   a) 104\(^2\)  
   b) 302\(^2\)  
   c) 89\(^2\)  
   d) 98\(^2\)  
   e) 105\(^2\)  
   f) 96\(^2\)  
   g) 989\(^2\)  
   h) 1003\(^2\)  
   i) 1005\(^2\)

   j) 997\(^2\)  
   k) 9.3 \times 8.7  
   l) 153 \times 147  
   m) 13 \times 7  
   n) 73 \times 67  
   o) 105 \times 103

   p) 98 \times 99  
   q) 205 \times 198  
   r) 107 \times 94  
   s) 12.5 \times 11.5  
   t) 20.5 \times 19.5  
   u) 50.2 \times 49.8

   v) 202\(^2\)  
   w) 995\(^2\)  
   x) 205 \times 195  
   y) 505 \times 503  
   z) 298 \times 297
1. Find the common factors of the following:-
   (a) $6x^2$ and $30xy^2$,
   (b) $xy, xy^2, x^2 y^2$, and $xyz$,
   (c) $a^2 b$, $abc^2$, $a^3 b^2 c$,
   (d) $5xyz$, $7x^2 y$ and $35xy$.

2. Factorise :
   (a) $3x + 12$,
   (b) $x^3 - x^2$,
   (c) $2xy - 4x + 18x^2$,
   (d) $20x^{15} - 15x^6 y^5$

3. Factorise :
   (a) $x^2 + 2x + xy + 2y$,
   (b) $pq - qr - pr + r^2$,
   (c) $axy + bcxy - az - bcz$,
   (d) $a^2 + ac + bc + ab$

4. Factorise :
   (a) $9a^2 + 12ab + 4b^2$,
   (b) $1 - 16x^2 + 64x^4$, (c) $a^2 - 64$, (d) $16x^2 - 9y^2$.

5. Factorise :
   (a) $x^2 + 9x + 20$,
   (b) $x^2 - 6x + 8$,
   (c) $m^2 - 2m - 15$,
   (d) $x^2 + x - 6$.

6. Divide:
   (a) $6x^3 y^2 z^3$ by $3x^2 y z$,
   (b) $15m^2 n^3$ by $5m^2 n^2$,
   (c) $24a^3 b^3$ by $( - 8ab)$,
   (d) $21abc^2$ by $7abc$. 

3
7. Divide:
   (a) \(x + 2x^2 + 3x^4 - x^5\) by \(2x\),
   (b) \(24x^3y - 20x^2y^2 - 4xy\) by \(2xy\),
   (c) \(64x^4yz - 16xy^5z + 8x^2yz^4\) by \(4xyz\),
   (d) \(6x^3y^2 - 4x^2y + 8xy\) by \(\frac{2xy}{3}\).

8. Simplify:
   (a) \(6(4x - 8y) + 3(x - 2y)\),
   (b) \(12x^2(49x^2 - 64y^2) - 6x(7x + 8y)\),
   (c) \(4abc(a + b)(b + c)(c + a) + 2ab(b + c)(c + a)\),
   (d) \(x^2(x + 1)(x + 2)(x + 3) + x(x + 2)\).

9. Factorise and divide:
   (a) \(x^2 + 22x + 96\) by \((x + 16)\),
   (b) \(y^2 - 5y - 14\) by \((y + 2)\),
   (c) \(x^2 - 5x + 6\) by \((x - 3)\),
   (d) \(x^2 + 4x - 12\) by \((x - 2)\).

10. Divide:
    (a) \((a^2 + 2ab + b^2) - (a^2 + 2ac + c^2)\) by \((2a + b + c)\),
    (b) \(x^4 - y^4\) by \((x^2 - y^2)\),
    (c) \(4x^2 - 121y^2\) by \((2x + 11y)\),
    (d) \(acx^2 + (bc + ad)x + bd\) by \((ax + b)\).
INTRODUCTION TO GRAPH

1. The co-ordinates of origin is _________

2. For fixing a point on the graph sheet we need, ___________ and ___________.

3. A ___________ displays data that changes continuously over periods of time.

4. A line graph which is a whole unbroken line is called a ___________.

5. A ___________ is used to compare parts of a whole.

6. The point (0, 5) lies on _________ axis.

7. The following table shows the number of days a city received a rainfall in different years.

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>10</td>
<td>18</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
</tr>
</tbody>
</table>

Draw a line graph to show the data.

8. Plot the following points on a graph sheet.
   (i) A (4, 3) B (2, 6) C (-3, 5) D (-5, 2)
   (ii) E (-2, -3) F(-6, 3) G(5, -4) H(10, 0)

9. Complete the following table of values and make a graph for each of the following.

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y = 5x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y = x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Draw a line graph representing the following data

<table>
<thead>
<tr>
<th>Number of oranges</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost in Rs</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of men(in thousands)</td>
<td>9</td>
<td>9.5</td>
<td>10</td>
<td>10.2</td>
<td>10.5</td>
</tr>
<tr>
<td>Number of women(in thousands)</td>
<td>11.5</td>
<td>12</td>
<td>12.8</td>
<td>13</td>
<td>12.5</td>
</tr>
</tbody>
</table>

11. A train is moving at a constant speed of 80km/h. Draw a distance-time graph. Find from your graph
   (i) How much distance will the train cover in 2 hours 30 minutes?
   (ii) How long will the train take to cover a distance of 200km?
11. Write the coordinates of the vertices of each of these adjoining figures.

12. The following graph shows the day temperature recorded every hour in a city.
   a. What was the city’s temperature at 12 noon?
   b. What was the time recorded a temperature of 30.5°C?
   c. What was the temperature at 2.30 pm.?
   d. During which hours did the temperature show a rising trend?

13. The following graph shows the total enrolment of students in school A and school B of a town.
   Read the graph and answer the questions.
   a. How many students were enrolled in school A in the year 2009?
   b. How many students were enrolled in the two schools together in the year 2012?
   c. In which year was the number of students equal in the two schools?