પુ.ના International School
Shree Swaminarayan Gurukul, Zundal

ASSIGNMENT PA 3

Class –8 **CH -8, 9,11,12 and 13** **Sub: MATHS**

QUESTION 1

(i) Multiple Choice Questions: **[1 MARKS QUESTION]**

CHAP 8

1. By selling 50 items, a shopkeeper lost the amount equal to the selling price of 10 items. His loss percent is

   a. 30/7 % b. 40/3 % c. 25/3 % d. 50/3 %

2. After allowing a discount of 15 % on the marked price of a pen-drive, it is sold for Rs 680. The marked price of the article is

   a. Rs 700 b. Rs 600 c. Rs 800 d. Rs 750

3. Sachin purchases a bat for Rs 660 including sales tax. If the rate of sales tax is 10 %, then the selling price of the bat is

   a. Rs 580 b. Rs 590 c. Rs 600 d. Rs 610

4. The buying price of 5 kg guava, at the rate Rs 20 per kg with 5 % sales-tax on the purchase, is

   a. Rs 22 b. Rs 23 c. Rs 24 d. None

5. A sum is taken for 2 year at 16 % per annum, if interest is compounded after every three months, the number of times for which interest is charged in 2 year is

   a. 8 b. 4 c. 6 d. 9

CHAP 9

1. a (b + c) = a b + a c is

   a. commutative property b. closure property
   c.distributive property d. associative property

2. The product of a monomial and binomial is a

   a. binomial b. monomial c. trinomial d. None

3. In a polynomial, the exponents of the variables are always

a. integers b. non-positive integers

c. non negative integers d. None

4. Which of the following is a binomial?

a. 13XbXb b. $6b^2 + 7a + 2c$ c. $45 (b^2 + a)$ d. 13a X 3b X 5c

5 . Sum of 17abc, 13abc and 5abc is

a. 35ab b. 30abc c. 35abc d None

Chap 11

1. If the height of a cylinder becomes ¼ of the original height and the radius is doubled, then which of the following will be true?

a. Volume of the cylinder will be doubled. b. Volume of the cylinder will remain unchanged

c. Volume of the cylinder will be halved d. Volume of the cylinder will be ¼ of the original

2. Volume of a cube is 216 cm^3, its surface area is

a. 108 cm^2 b. 216 cm^2 c. 512 cm^2 d. 128 cm^2

3. A cube of side 4 cm is cut into 1 cm cubes. What is the ratio of the surface areas of the original cubes and cut-out cubes?

a. 1:2 b. 1:3 c. 1:4 d. 1:6

4. The perimeter of a trapezium is 104 cm and its each non parallel side vis equal to 40 cm with its height of 16 cm. its area is

CHAP 12

1. In 3^n, n is known as
   a. base b. constant c. exponent d. variable
2. 5^{-2} can be written as
   a. 1/5 b. $1/5^2$ c. 5^2 d. -2/5
3. The value of $\frac{1}{9^{-2}}$ is
   a. 27 b. 81 c. -81 d. 18
4. The multiplicative inverse of 10^{-1000} is
   a. 10^{-100} b. -10^{1000} c. 10^{1000} d. -10^{100}
5. The reciprocal of $\left(\frac{3}{7}\right)^{-1}$ is

a. $\frac{7}{3}$ b. $-\frac{3}{7}$ c. $-\frac{7}{3}$ d. $\frac{3}{7}$

CHAP 13

1. Both u and v directly with each other .When u is 10, v is 15, which of the following is not a possible pair of corresponding value of u and v ?

   a. 15 and 20 b. 2 and 3 c. 25 and 37.5 d. 16 and 24

2. The number of teeth and the age of a person vary
   a. Directly to each other
   b. Inversely to each other
   c. Neither directly nor Inversely to each other
   d. Some time directly and some time inversely

3. If 12m uniform rod weight 42kg, then the weight of 5m rod of the same type will be

   a. 16.5 kg b. 15.2 kg c. 17.5 kg d. 18.2 kg

4. If two quantities p and q vary inversely with each other, then
   a. $\frac{p}{q}$ remains constant b. p + q remains constant

   c. p X q remains constant d. p – q remains constant

5. 18 workers can do a work in 180 days. If two more workers join this work will be completed in
   a. 140 days b. 150 days c. 158 days d. 162 days

CHAP: 14

1. The greatest common factor of 6a and 12b is

a. 6 b. 2 c. 3 d. 1

2. Coefficient of y in the term $\frac{-y}{3}$ is

a. -1 b. -3 c. -1/3 d. 1/3

3. The common factor of 3ab and 2cd is

a. 1 b. -1 c. a d. c

4. The product of a monomial and a binomial is a

a. monomial b. binomial c. trinomial d. None

5. Which of the following is a binomial?

a. 7 x a x a b. $6a^2 + 7b + 2c$ c. 4a x 3b x 2c d. $6 (a^2 + b)$

(ii) Fill the blank: **[1 MARKS QUESTION]**

CHAP 8

1. _____ is a reduction on the marked price of the article.

Answer: Discount

2. Discount = _____ - _____

Answer: Marked price, selling price

3. 3500 is greater than 500 by _____ %

Answer: 600

4. Ten times a number is _____ % increase in the number.

Answer: 900

5. If the discount of Rs 5y is available on the marked price of Rs 3x, then the discount per cent is _____

Answer: $(\frac{5y}{3x}$ X 100) %

CHAP 9

1. Coefficient of y in the term -13/3 y is _____

Answer: -13/3

2. The value of $(a + b)^2 – (a - b)^2$ is_____

Answer: 4ab

3. The product of two polynomials is a _____

Answer: polynomial

4. Square of (3a + 5b) is _____

Answer: $9a^2 + 30ab + 25b^2$

5 . The product of two terms with like signs is a _____ term.

Answer: positive polynomial

CHAP 11

1. Volume of a cylinder with the radius r and height h is _____
   Ans: $\pi r^2 h$
2. Opposite faces of a cuboid are _____ in area.
   Ans: equal
3. Area of circle = _____
   Ans: : πr^2
4. A metal sheet 27 cm long, 8cm board and 1 cm thick is melted into a cube. The side of a cube is _____

Ans: 6cm

5. Area of a rhombus = $\frac{1}{2}$ x product of _____

Ans: diagonals

CHAP 12

1. The multiplicative inverse of 10^{10} is _____

   Ans: 10^{-10}
2. a^{13} X a^{-10} = _____

   Ans: a^3
3. The value of $(\frac{1}{2^3})^2$ is equal = _____

   Ans: $\frac{1}{64}$
4. 100^{0} = _____

   Ans: 1
5. The standard form of 12345000000 is _____

   Ans : 1.2345 X 10^{10}

CHAP 13

1. Let x varies directly as y^2, for y =3, x =2. If y =5 then x is _____

   Ans: $5\frac{5}{9}$
2. X and y are said to vary directly with each other, if for some positive number k, _____ = k.

   Ans: $\frac{x}{y}$
3. If x y = 10, then x and y vary _____ with each other.

   Ans: Inversely
4. When the speed remain constant, the distance travelled is _____ proportion to the time

   Ans: directly
5. The perimeter of a circle and its diameter vary _____ with each other

   Ans: directly

CHAP 14

1. The product of two polynomials is a _____.

Ans: polynomial

2. The common factor method of factorization for a polynomial is based on _____ law.

Ans: distributive

3. (x + a) (x + b) = x^2 + (a + b) x +_____.

Ans: a x b

4. The value of (a + b)^2 + (a - b)^2 is _____.

Ans: $2a^2 + 2b^2$

5. Number of factors of $(a + b)^2$ is _____

Ans: 2

(iii) Tell whether the statement is true or false: [1 MARKS QUESTION]

CHAP 8

1. To calculate the growth of bacteria, if the rate of growth is known. The formula for calculation of amount in compound interest can be used. TRUE
2. C P = M P – Discount FALSE
3. . The sale price is regular price minus the discount. TRUE
4. The cost price of 10 tables is equal to the sale price of 5 tables. Then, profit percent is 100% FALSE
5. If for the principal P, rate R % and time T, the simple interest is SI and compound interest is CI. Then, CI > SI. TRUE

CHAP 9

1. The value of $(a + b)^2 + (a - b)^2$ is 4ab. FALSE
2. The coefficient of x^2 yz in the term $-19x^2yz$ is -19. TRUE
3. An equation is true for all values of its variables. FALSE
4. The value of p for $21^2 – 19^2 = 10p$ is 8. TRUE
5. abc + bca + cab is a monomial TRUE

CHAP 11

1. The area of any two faces of a cube is equal.

Ans: True

2. The area of any two faces of a cuboid is equal.

Ans: False

3. The area of a trapezium becomes 4 times if its height gets doubled.

Ans: False

4. Two cuboids with equal volumes will always have equal surface areas.

Ans: False

5. Volumes of a solid are the measurement of the space occupied by it.

Ans: True

CHAP 12

1. The multiplicative inverse of $(-3)^{-2}$ is 3^{-2}

Ans: False

2. The reciprocal of $(\frac{3}{2})^3$ is not equal to $(\frac{3}{2})^{-3}$

Ans: False

3. $3829.26 = 3X\ 10^3 + 8\ X\ 10^2 + 2\ X\ 10^1 + 9\ X\ 10^0 + 2\ X\ 10^{-1} + 6\ X\ 10^{-2}$

Ans: True

4. $(\frac{-9}{2})^0 = 0$

Ans: False

5. The value of $\frac{1}{7^{-3}}$ is equal to 216

Ans: False

CHAP 13

1. If d varies directly as t^2 , then we can write $dt^2 = k$, where k is some constant
   Ans: False
2. The population of a country and the area of land per person are in direct proportion.
   Ans: False
3. The distance travelled by CNG bus and the amount of CNG used are inversely proportion.
   Ans: False
4. If 5 persons can finish a job in days, then 1 person will finish it in 2 days.
   Ans: False
5. If x varies inversely as y and when x = 6, y =8, then for x = 8 then for x =8 the value of y is 10.
   Ans: False

CHAP 14

1. The difference of squares of two consecutive numbers is their sum.
   Ans: True
2. An equation is true for all the values of its variables.
   Ans: False
3. An identity is true for all values of its variables
   Ans: True
4. The value of (a + 1) (a - 1) $(a^2 + 1)$ is $(a^2 + 1)$ is $(a^4 + 1)$.
   Ans: False
5. The sum of areas of two squares with sides 5a and 5b is 25 (a + b) (a - b).
   Ans: False

(iv) Solve: Each carry one mark: [1 MARKS QUESTION]

CHAP 8 and 9

1. If 7/3 % of a number is 147, then find the number.
2. After increasing 15 % of the price of an article. Its price is Rs 1725. Find the increased amount.
3. Find the discount ,When M.P = Rs 625 and S P = Rs 562.50
4. Convert 7:3 in to percentage.
5. What per-cent of 500 is 35?
6. Add: 7xy and -5xy

7. Subtract: 4abc from 12abc
8. Find product: -4p, 7pq
9. Find product: (a^2) X $(2a^3)$
10. Add: ab – bc, bc – ca and ca – ab

CHAP 11

1. If the area of a face of cube is 20 cm^2, then find the total surface area of the cube.

2. The volume of a cube is 343cm^2, find its surface area.

3 The areas of two circles are in the ratio 49: 64. Find the ratio of their circumferences.

4. Find the volume of a cuboid 18m long 14 broad and 7m high.

5 The area of a rhombus is 240 cm^2 and one of the diagonals is 16 cm. Find the other diagonal.

CHAP 12

I. Evaluate:

(i) 3^{-2} (ii) $(-4)^{-2}$ (iii) $\left(\frac{1}{2}\right)^{-5}$

Ans. (i) $3^{-2} = \frac{1}{3^2}$

$\left[\because \ a^{-m} = \frac{1}{a^m}\right]$

$= \frac{1}{9}$

(ii) $(-4)^{-2} = \frac{1}{(-4)^2}$

$\left[\because \ a^{-m} = \frac{1}{a^m}\right]$

$= \frac{1}{16}$

(iii) $\left(\frac{1}{2}\right)^{-5} = \left(\frac{2}{1}\right)^{5}$

$$\left[\because \ a^{-m} = \frac{1}{a^m}\right]$$

$= \quad (2)^5 = 32$

2. Simplify and express the result in power notation with positive exponent:

(i) $(-4)^5 \div (-4)^8$

(ii) $\left(\frac{1}{2^3}\right)^2$

(iii) $(-3)^4 \times \left(\frac{5}{3}\right)^4$

(iv) $\left(3^{-7} \div 3^{-10}\right) \times 3^{-5}$

(v) $2^{-3} \times (-7)^{-3}$

Ans. (i) $(-4)^5 \div (-4)^8 = (-4)^{5-8} \quad \left[\because \ a^m \div a^n = a^{m-n}\right]$

$= \quad (-4)^{-3} = \frac{1}{(-4)^3} \quad \left[\because \ a^{-m} = \frac{1}{a^m}\right]$

(ii) $\left(\frac{1}{2^3}\right)^2 = \frac{1^2}{\left(2^3\right)^2}$

$$\left[\because \ \left(\frac{a}{b}\right)^m = \frac{a^m}{a^n}\right]$$

$$(-3)^4 \times \left(\frac{5}{3}\right)^4 = (-3)^4 \times \frac{5^4}{3^4}$$

$= \quad \left[\because \ \left(a^m\right)^n = a^{m \times n}\right]$

$$\frac{1}{2^{3\times 2}} = \frac{1}{2^6} \qquad \left[\because \ \left(\frac{a}{b}\right)^m = \frac{a^m}{a^n}\right]$$

(iii) $(-3)^4 \times \left(\frac{5}{3}\right)^4 = (-3)^4 \times \frac{5^4}{3^4}$

=

$\left\{(-1)^4 \times 3^4\right\} \times \frac{5^4}{3^4}$

$\left[\because \quad (ab)^m = a^m b^m\right]$

$= 3^{4-4} \times 5^4 \quad \left[\because \quad a^m \div a^n = a^{m-n}\right]$

$= \quad 3^0 \times 5^4 = 5^4 \left[\because \quad a^0 = 1\right]$

(iv) $\left(3^{-7} \div 3^{-10}\right) \times 3^{-5} = 3^{-7-(-10)} \times 3^{-5} \quad \left[\because \quad a^m \div a^n = a^{m-n}\right]$

$= 3^{-7+10} \times 3^{-5} = 3^3 \times 3^{-5} = \quad 3^{3+(-5)} \left[\because \quad a^m \times a^n = a^{m+n}\right]$

$= \quad 3^{-2} = \frac{1}{3^2} \quad \left[\because \quad a^{-m} = \frac{1}{a^m}\right]$

(v) $2^{-3} \times (-7)^{-3} = \frac{1}{2^3} \times \frac{1}{(-7)^3} \quad \left[\because \quad a^{-m} = \frac{1}{a^m}\right]$

$= \quad \frac{1}{\{2 \times (-7)\}^3} = \frac{1}{(-14)^3} \quad \left[\because \quad (ab)^m = a^m b^m\right]$

3. Find the value of:

(i) $\left(3^0 + 4^{-1}\right) \times 2^2$

(ii) $\left(2^{-1} \times 4^{-1}\right) \div 2^{-2}$

(iii) $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$

(iv) $\left(3^{-1}+4^{-1}+5^{-1}\right)^{0}$

(v) $\left\{\left(\frac{-2}{3}\right)^{-2}\right\}^{2}$

Ans.

(i) $\left(3^{0}+4^{-1}\right)\times 2^{2} = \left(1+\frac{1}{4}\right)\times 2^{2} \quad \left[\because\ a^{-m}=\frac{1}{a^{m}}\right]$

$= \left(\frac{4+1}{4}\right)\times 2^{2} = \frac{5}{4}\times 2^{2} = \frac{5}{2^{2}}\times 2^{2} = 5\times 2^{2-2} \quad \left[\because\ a^{m}\div a^{n}=a^{m-n}\right]$

$= 5\times 2^{0} = 5\times 1 = 5 \quad \left[\because\ a^{0}=1\right]$

(ii) $\left(2^{-1}\times 4^{-1}\right)\div 2^{-2} = \left(\frac{1}{2^{1}}\times\frac{1}{4^{1}}\right)\div 2^{-2} \quad \left[\because\ a^{-m}=\frac{1}{a^{m}}\right]$

$= \left(\frac{1}{2}\times\frac{1}{2^{2}}\right)\div 2^{-2} = \frac{1}{2^{3}}\div 2^{-2} \quad \left[\because\ a^{m}\times a^{n}=a^{m+n}\right]$

$= 2^{-3}\div 2^{-2} = 2^{-3-(-2)} = 2^{-3+2} = 2^{-1} \quad \left[\because\ a^{m}\div a^{n}=a^{m-n}\right]$

$= \frac{1}{2} \quad \left[\because\ a^{-m}=\frac{1}{a^{m}}\right]$

(iii) $\left(\frac{1}{2}\right)^{-2}+\left(\frac{1}{3}\right)^{-2}+\left(\frac{1}{4}\right)^{-2}$

$= \left(2^{-1}\right)^{-2}+\left(3^{-1}\right)^{-2}+\left(4^{-1}\right)^{-2}$

$\left[\because\ a^{-m}=\frac{1}{a^{m}}\right]$

$\left[\because\ \left(a^{m}\right)^{n}=a^{m\times n}\right]$

$= 2^{-1\times(-2)} + 3^{-1\times(-2)} + 4^{-1\times(-2)}$

$= 2^2 + 3^2 + 4^2 = 4 + 9 + 16 = 29$

(iv) $\left(3^{-1} + 4^{-1} + 5^{-1}\right)^0 = \left(\frac{1}{3} + \frac{1}{4} + \frac{1}{5}\right)^0 \quad \left[\because \ a^{-m} = \frac{1}{a^m}\right]$

$= \left(\frac{20+15+12}{60}\right)^0 = \left(\frac{47}{60}\right)^0 = 1$

$\left[\because \ a^0 = 1\right]$

(v) $\left\{\left(\frac{-2}{3}\right)^{-2}\right\}^2 = \left(\frac{-2}{3}\right)^{-2\times 2} \quad \left[\because \ \left(a^m\right)^n = a^{m\times n}\right]$

$= \left(\frac{-2}{3}\right)^{-4} = \left(\frac{-3}{2}\right)^4 \quad \left[\because \ a^{-m} = \frac{1}{a^m}\right]$

$= \frac{81}{16}$

CHAP 13

. 1. If the cost of 10 pencils is Rs 90. Find the cost of 19 pencils?

2. A machine in a soft drink factory fills 840 bottles in six hours. How many bottles will it fill in five hours?

Ans. Let the number of bottles filled in five hours be x.

Hours	6	5
Bottles	840	x

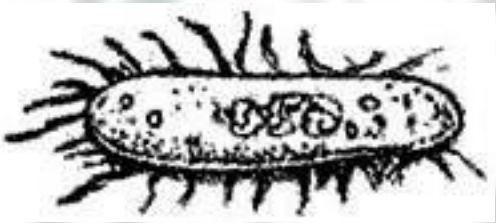
Here ratio of hours and bottles are in direct proportion

$\therefore \frac{6}{840} = \frac{5}{x}$

$\Rightarrow x = \frac{5 \times 840}{6} = 700$ bottles

Hence machine will fill 700 bottles in five hours.

3. A photograph of a bacteria enlarged 50,000 times attains a length of 5 cm as shown in the diagram. What is the *actual* length of the bacteria? If the photograph is enlarged 20,000 times only, what would be its enlarged length?



Ans. Let Actual length of bacteria be 'a'

It is enlarged 50,000 times so 50000 x a = 5 cm

Actual length of bacteria

$= \frac{5}{50000} = \frac{1}{10000}$ cm = 10^{-4} cm

Let enlarged length of bacteria be x

Length	5	x
Enlarged length	50,000	20,000

Here length and enlarged length of bacteria are in direct proportion.

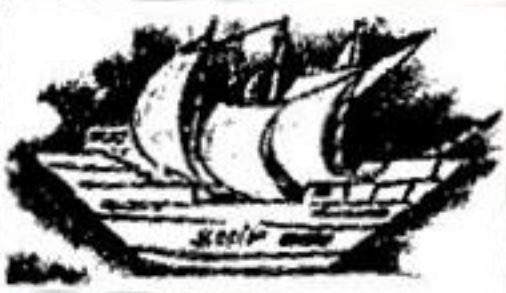
$\therefore \frac{5}{50000} = \frac{x}{20000}$

$\Rightarrow x \times 50000 = 5 \times 20000$

$\Rightarrow x = \frac{5 \times 20000}{50000}$ = 2 cm

Hence the enlarged length of bacteria is 2 cm.

4. In a model of a ship, the mast is 9 cm high, while the mast of the actual ship is 12 m high. If the length of the ship is 28 m, how long is the model ship?



Ans. Let the length of model ship be x.

Length of actual ship (in m)	12	28
Length of model ship (in cm)	9	x

Here length of mast and actual length of ship are in direct proportion.

$\therefore \frac{12}{9} = \frac{28}{x}$

$\Rightarrow x \times 12 = 28 \times 9$

$\Rightarrow x = \frac{28 \times 9}{12}$ = 21 cm

Hence length of the model ship is 21 cm.

CHAp 14

1. Find the common factors of the given terms.

(i) $12x, 36$

(ii) $2y, 22xy$

(iii) $14pq, 28p^2q^2$

(iv) $2x, 3x^2, 4$

(v) $6abc, 24ab^2, 12a^2b$

2. Factorize the following expressions.

(i) $7x - 42$

(ii) $6p - 12q$

(iii) $7a^2 + 14a$

(iv) $-16z + 20z^3$

(v) $20l^2m + 30alm$

3. **Factorize:**

(i) $x^2 + xy + 8x + 8y$

(ii) $15xy - 6x + 5y - 2$

(iii) $ax + bx - ay - by$

(iv) $15pq + 15 + 9q + 25p$

(v) $z - 7 + 7xy - xyz$

QUESTION 2

Solve: Each carry two marks:

CHAP 8 and 9

1. 72% of 25 students are good in mathematics. How many are not good in mathematics?

Ans. Total number of students = 25

Number of good students in mathematics = 72% of 25 = $\frac{72}{100} \times 25$ = 18

Number of students not good in mathematics = 25 – 18 = 7

Hence percentage of students not good in mathematics = $\frac{7}{25} \times 100$ = 28%

2. A football team won 10 matches out of the total number of matches they played. If their win percentage was 40, then how many matches did they play in all?

Ans. Let total number of matches be x.

According to question,

40% of total matches = 10

$\Rightarrow$ 40% of x = 10

$\Rightarrow \frac{40}{100} \times x = 10$

$\Rightarrow x = \frac{10 \times 100}{40}$ = 25

Hence total number of matches is 25.

3. A man got 10% increase in his salary. If his new salary is Rs.1,54,000, find his original salary.

Ans. Let original salary be Rs.100.

Therefore New salary i.e., 10% increase

= 100 + 10 = Rs.110

∵ New salary is Rs.110, when original salary = Rs.100 ∴

New salary is Rs.1, when original salary = $\frac{100}{110}$

∴ New salary is Rs.1, 54,000, when original salary = $\frac{100}{110} \times 154000$ = Rs.1,40,000

Hence original salary is Rs. 1, 40,000.

4. On Sunday 845 people went to the Zoo. On Monday only 169 people went. What is the percent decrease in the people visiting the Zoo on Monday?

Ans. On Sunday, people went to the Zoo = 845 On

Monday, people went to the Zoo = 169

Number of decrease in the people = 845 – 169 = 676

Decrease percent = $\frac{676}{845} \times 100$ = 80%

Hence decrease in the people visiting the Zoo is 80%.

5. Add the following:

(i) $ab - bc, bc - ca, ca - ab$

(ii) $a - b + ab, b - c + bc, c - a + ac$

(iii) $2p^2q^2 - 3pq + 4, 5 + 7pq - 3p^2q^2$

(iv) $l^2+m^2, m^2+n^2, n^2+l^2+2lm+2mn+2nl$

Ans. (i) $ab-bc, bc-ca, ca-ab$

$$\begin{array}{l} ab-bc \\ \quad +bc-ca \\ -ab \quad +ca \\ \hline \quad 0+0+0 \end{array}$$

(ii) $a-b+ab, b-c+bc, c-a+ac$

$$\begin{array}{lll} a-b-ab & & \\ \quad +b & -c+bc & \\ -a & +c & +ac \\ \hline 0+0+ab+0+bc+ac & & \end{array}$$

Hence the sum if 0.

Hence the sum is $ab+bc+ac.$

(iii) $2p^2q^2-3pq+4, 5+7pq-3p^2q^2$

$$\begin{array}{l} 2p^2q^2-3pq+4 \\ -3p^2q^2+7pq+5 \\ \hline -p^2q^2+4pq+9 \end{array}$$

(iv) $l^2+m^2, m^2+n^2, n^2+l^2, 2lm+2mn+2nl$

$$\begin{array}{l} \quad l^2+m^2 \\ +\quad m^2+n^2 \\ +l^2 \quad +n^2 \\ +\qquad 2lm+2mn+2nl \\ \hline 2l^2+2m^2+2n^2+2lm+2mn+2nl \end{array}$$

Hence the sum is

$2\left(l^2+m^2+n^2+lm+mn+nl\right)$.

6. Obtain the volume of rectangular boxes with the following length, breadth and height respectively:

(i) $5a, 3a^2 7a^4$

(ii) $2p, 4q, 8r$

(iii) $xy, 2x^2y, 2xy^2$

(iv) $a, 2b, 3c$

Ans. (i) Volume of rectangular box

$= length \times breadth \times height$

$= 5a \times 3a^2 \times 7a^4 = (5 \times 3 \times 7)(a \times a^2 \times a^4)$

$= 105a^7$ cubic units

(ii) Volume of rectangularbox

$= length \times breadth \times height$

$= 2p \times 4q \times 8r = (2 \times 4 \times 8)(p \times q \times r)$

$= 64pqr$ cubic units

(iii) Volume of rectangularbox

$= length \times breadth \times height$

$= xy \times 2x^2y \times 2xy^2$

$= (1 \times 2 \times 2)(x \times x^2 \times x \times y \times y \times y^2)$

= $4x^4y^4$ cubic units

(iv) Volume of rectangularbox

$= length \times breadth \times height$

= $a \times 2b \times 3c = (1 \times 2 \times 3)(a \times b \times c)$

= $6abc$ cubic units

7. Find the product:

(i) $(a^2) \times (2a^{22}) \times (4a^{26})$

(ii) $\left(\frac{2}{3}xy\right) \times \left(\frac{-9}{10}x^2y^2\right)$

(iii) $\left(\frac{-10}{3}pq^3\right) \times \left(\frac{6}{5}p^3q\right)$

(iv) $x \times x^2 \times x^3 \times x^4$ Ans.

(i) $(a^2) \times (2a^{22}) \times (4a^{26})$

$= (2 \times 4)(a^2 \times a^{22} \times a^{26})$

= $8 \times a^{2+22+26} = 8a^{50}$

(ii) $\left(\frac{2}{3}xy\right) \times \left(\frac{-9}{10}x^2y^2\right)$

= $\left(\frac{2}{3} \times \frac{-9}{10}\right)(x \times x^2 \times y \times y^2)$

= $\frac{-3}{5}x^3y^3$

(iii) $\left(\frac{-10}{3}pq^3\right)\left(\frac{6}{5}p^3q\right)$

= $\left(\frac{-10}{3}\times\frac{6}{5}\right)\left(p\times p^3\times q^3\times q\right)$

= $-4p^4q^4$

(iv) $x\times x^2\times x^3\times x^4 = x^{1+2+3+4}$ = x^{10}

8. Multiply the binomials:

(i) (2x+5) and (4x-3)

(ii) $(y-8)$ and $(3y-4)$

(iii) $(2.5l-0.5m)$ and $(2.5l+0.5m)$

(iv) $(a+3b)$ and $(x+5)$

(v) $\left(2pq+3q^2\right)$ and $\left(3pq-2q^2\right)$

(vi) $\left(\frac{3}{4}a^2+3b^2\right)$ and $4\left(a^2-\frac{2}{3}b^2\right)$

Ans.

(i) $(2x+5)\times(4x-3)$

$= 2x(4x-3)+5(4x-3)$

$= 2x\times 4x-2x\times 3+5\times 4x-5\times 3$

$= 8x^2-6x+20x-15$

$= 8x^2+14x-15$

(ii) $(y-8)\times(3y-4)=y(3y-4)-8(3y-4)$

$= y\times 3y-y\times 4-8\times 3y-8\times -4$

$= 3y^2 - 4y - 24y + 32$

$= 3y^2 - 28\ y + 32$

(iii) $(2.5l-0.5m)\times(2.5l+0.5m)$

$= 2.5l\times(2.5l+0.5m)-0.5m\times(2.5l+0.5m)$

= 2.5l x 2.5l + 2.5l x 0.5m - 0.5m x 2.5l - 0.5m x0.5m

$= 6.25l^2+1.25lm-1.25lm-0.25m^2$

$= 6.25l^2-0.25m^2$

(iv) $(a+3b)\times(x+5)=a(x+5)+3b(x+5)$

$= a\times x+a\times 5+3b\times x+3b\times 5$

$= ax+5a+3bx+15b$

(v) $(2pq+3q^2)(3pq-2q^2)$

$= 2pq \times (3pq - 2q^2) + 3q^2(3pq - 2q^2)$

$= 2pq \times 3pq - 2pq \times 2q^2 + 3q^2 \times 3pq - 3q^2 \times 2q^2$

$= 6p^2q^2 - 4pq^3 + 9pq^3 - 6q^4$

$= 6p^2q^2 + 5pq^3 - 6q^4$

(vi) $\left(\frac{3}{4}a^2 + 3b^2\right) \times 4\left(a^2 - \frac{2}{3}b^2\right)$

$= \left(\frac{3}{4}a^2 + 3b^2\right) \times \left(4a^2 - \frac{8}{3}b^2\right)$

$= \frac{3}{4}a^2 \times \left(4a^2 - \frac{8}{3}b^2\right) + 3b^2 \times \left(4a^2 - \frac{8}{3}b^2\right)$

$= \frac{3}{4}a^2 \times 4a^2 - \frac{3}{4}a^2 \times \frac{8}{3}b^2 + 3b^2 \times 4a^2 - 3b^2 \times \frac{8}{3}b^2$

$= 3a^4 - 2a^2b^2 + 12a^2b^2 - 8b^4$

$= 3a^4 + 10a^2b^2 - 8b^4$

Solve: Each carry three marks

1. Kamala borrowed Rs.26, 400 from a Bank to buy a scooter at a rate of 15% p.a. compounded yearly. What amount will she pay at the end of 2 years and 4 months to clear the loan?

(Hint: Find A for 2 years with interest is compounded yearly and then find SI on the 2nd year amount for $\frac{4}{12}$ years).

Ans. Here, Principal (P) = Rs. 26,400, Time(n) = 2 years 4 months, Rate of interest (R) = 15% p.a.

Amount for 2 years (A) = $P\left(1 + \frac{R}{100}\right)^n$

$= 26400\left(1+\frac{15}{100}\right)^2 = 26400\left(1+\frac{3}{20}\right)^2$

$= 26400\left(\frac{23}{20}\right)^2 = 26400\times\frac{23}{20}\times\frac{23}{20}$

= Rs. 34,914

Interest for 4 months = $\frac{4}{12}=\frac{1}{3}$ years at the rate of 15% = $\frac{34914\times15\times1}{100}$

= Rs. 1745.70

∴ Total amount = Rs. 34,914 + Rs. 1,745.70

= Rs. 36,659.70

2. Fabina borrows Rs.12,500 per annum for 3 years at simple interest and Radha borrows the same amount for the same time period at 10% per annum, compounded annually. Who pays more interest and by how much?

Ans. Here, Principal (P) = Rs.12, 500, Time (T) = 3 years,

Rate of interest (R) = 12 % p.a.

Simple Interest for Fabina = $\frac{P\times R\times T}{100}$

$= \frac{12500\times12\times3}{100}$ = Rs. 4,500

Amount for Radha, P = Rs. 12,500, R = 10% and n = 3 years

Amount (A) = $P\left(1+\frac{R}{100}\right)^n$

$= 12500\left(1+\frac{10}{100}\right)^3 = 12500\left(1+\frac{1}{10}\right)^3$

$= 12500\left(\frac{11}{10}\right)^3 = 12500\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}$

= Rs. 16,637.50

∴ C.I. for Radha = A – P

= Rs. 16,637.50 – Rs. 12,500 = Rs. 4,137.50

Thus, Fabina pays more interest

= Rs. 4,500 – Rs. 4,137.50 = Rs. 362.50

3.. I borrows Rs.12, 000 from Jam shed at 6% per annum simple interest for 2 years. Had I borrowed this sum at 6% per annum compound interest, what extra amount would I have to pay?

Ans. Here, Principal (P) = Rs.12,000, Time (T) = 2 years, Rate of interest (R) = 6% p.a. Simple Interest

$$= \frac{P \times R \times T}{100}$$

$$= \frac{12000 \times 6 \times 2}{100} = \text{Rs. } 1,440$$

Had he borrowed this sum at 6% p.a., then

Compound Interest $= P\left(1+\frac{R}{100}\right)^{n} - P$

$$= 12000\left(1+\frac{6}{100}\right)^{2} - 12000$$

$$= 12000\left(1+\frac{3}{50}\right)^{2} - 12000$$

$$= 12000\left(\frac{53}{50}\right)^{2} - 12000$$

$$= 12000 \times \frac{53}{50} \times \frac{53}{50} - 12000$$

= Rs. 13,483.20 – Rs. 12,000

= Rs. 1,483.20

Difference in both interests

= Rs. 1,483.20 – Rs. 1,440.00 = Rs. 43.20

Thus, the extra amount to be paid is Rs.43.20

4. Vasudevan invested Rs.60, 000 at an interest rate of 12% per annum compounded half yearly. What amount would he get:

(i) After 6 months?

(ii) after 1 year?

Ans. (i) Here, Principal (P) = Rs. 60,000, Time (n) = 6 months = 1 year(compounded half yearly)
Rate of interest (R) = 12% = 6% (compounded half yearly)

Amount (A) = $P\left(1+\frac{R}{100}\right)^{n}$

= $60000\left(1+\frac{6}{100}\right)^{1}$

= $60000\left(1+\frac{3}{50}\right)^{1}$

= $60000\left(\frac{53}{50}\right)^{1}$

= $60000\times\frac{53}{50}$

= Rs.63,600

After 6 months Vasudevan would get amount Rs. 63,600.

(ii) Here, Principal (P) = Rs. 60,000,

Time (n) = 1 year = 2 year(compounded half yearly)

Rate of interest (R) = 12% = 6% (compounded half yearly)

Amount (A) = $P\left(1+\frac{R}{100}\right)^{n}$

$60000\left(1+\frac{6}{100}\right)^{2}$

=

= $60000\left(1+\frac{3}{50}\right)^2$

= $60000\left(\frac{53}{50}\right)^2$

= $60000\times\frac{53}{50}\times\frac{53}{50}$

= Rs. 67,416

After 1 year Vasudevan would get amount Rs. 67,416.

5. Find the product:

(i) $(5-2x)(3+x)$

(ii) $(x+7y)(7x-y)$

(iii) $(a^2+b)(a+b^2)$

(iv) $(p^2-q^2)(2p+q)$ Ans. (i)

$(5-2x)(3+x)$

$=5\times(3+x)-2x(3+x)$

$=5\times3+5\times x-2x\times3-2x\times x$

$=15+5x-6x-2x^2 = 15-x-2x^2$

(ii) $(x+7y)(7x-y)$

$=x(7x-y)+7y\times(7x-y)$

$= x \times 7x - x \times y + 7y \times 7x - 7y \times y$

$= 7x^2 - xy + 49xy - 7y^2$

$= 7x^2 + 48xy - 7y^2$

(iii) $\left(a^2 + b\right)\left(a + b^2\right)$

$= a^2 \times \left(a + b^2\right) + b \times \left(a + b^2\right)$

$= a^2 \times a + a^2 \times b^2 + b \times a + b \times b^2$

$= a^3 + a^2b^2 + ab + b^3$

(iv) $\left(p^2 - q^2\right)(2p + q)$

$= p^2 \times (2p + q) - q^2(2p + q)$

$= p^2 \times 2p + p^2 \times q - q^2 \times 2p - q^2 \times q$

$= 2p^3 + p^2q - 2pq^2 - q^3$

6. Simplify:

(i) $\left(x^2 - 5\right)(x + 5) + 25$

(ii) $\left(a^2 + 5\right)\left(b^2 + 3\right) + 5$

(iii) $\left(t + s^2\right)\left(t^2 - s\right)$

(iv) $(a + b)(c - d) + (a - b)(c + d) + 2(ac + bd)$

(v) $(x+y)(2x+y)+(x+2y)(x-y)$

(vi) $(x+y)(x^2-xy+y^2)$

(vii) $(1.5x-4y)(1.5x+4y+3)-4.5x+12y$

(viii) $(a+b+c)(a+b-c)$

$(x^2-5)(x+5)+25$

$= x^2(x+5)-5(x+5)+25$

Ans. (i)

$= x^2 \times x + x^2 \times 5 - 5 \times x - 5 \times 5 + 25$

$= x^3 + 5x^2 - 5x - 25 + 25$

$= x^3 + 5x^2 - 5x$

(ii) $(a^2+5)(b^3+3)+5$

$= a^2(b^3+3)+5(b^3+3)+5$

$= a^2 \times b^3 + a^2 \times 3 + 5 \times b^3 + 5 \times 3 + 5$

$= a^2b^3 + 3a^2 + 5b^3 + 15 + 5$

$= a^2b^3 + 3a^2 + 5b^3 + 20$

(iii) $(t+s^2)(t^2-s) = t(t^2-s)+s^2(t^2-s)$

$= t \times t^2 - t \times s + s^2 \times t^2 - s^2 \times s$

$= \quad t^3 - st + s^2t^2 - s^3$

(iv) $(a+b)(c-d)+(a-b)(c+d)+2(ac+bd)$

$= a(c-d)+b(c-d)+a(c+d)-b(c+d)+2ac+2bd$

$= ac-ad+bc-bd+ac+ad-bc-bd+2ac+2bd$

$= ac+ac-ad+ad+bc-bc-bd-bd+2ac+2bd$

$= 2ac-2bd+2ac+2bd$

$= \quad 4ac$

(v) $(x+y)(2x+y)+(x+2y)(x-y)$

$= x(2x+y)+y(2x+y)+x(x-y)+2y(x-y)$

$= \quad 2x^2+xy+2xy+y^2+x^2-xy+2xy-2y^2$

$= 2x^2+x^2+xy+2xy-xy+2xy+y^2-2y^2$

$= \quad 3x^2+4xy-y^2$

(vi) $(x+y)(x^2-xy+y^2)$

$= x(x^2-xy+y^2)+y(x^2-xy+y^2)$

$= \quad x^3-x^2y+xy^2+x^2y-xy^2+y^3$

$= x^3-x^2y+x^2y+xy^2-xy^2+y^3$

$\quad x^3+y^3$

=

(vii) $(1.5x-4y)(1.5x+4y+3)-4.5x+12y$

$=1.5x(1.5x+4y+3)-4y(1.5x+4y+3)-4.5x+12y$

$= 2.25x^2+6.0xy+4.5x-6.0xy-16y^2-12y-4.5x+12y$

$= 2.25x^2+6.0xy-6.0xy+4.5x-4.5x-16y^2-12y+12y$

$= 2.25x^2-16y^2$

(viii) $(a+b+c)(a+b-c)$

$=a(a+b-c)+b(a+b-c)+c(a+b-c)$

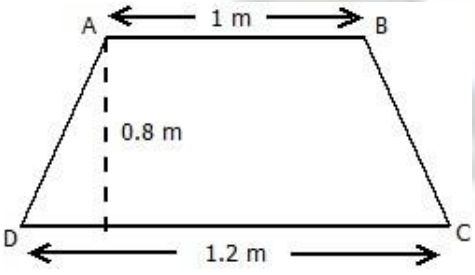
$= a^2+ab-ac+ab+b^2-bc+ac+bc-c^2$

$= a^2+ab+ab-ac+ac-bc+bc+b^2-c^2$

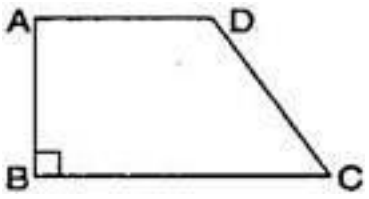
$= a^2+b^2-c^2+2ab$

CHAP 11

1. The shape of the top surface of a table is a trapezium. Find its area if its parallel sides are 1 m and 1.2 m and perpendicular distance between them is 0.8 m.

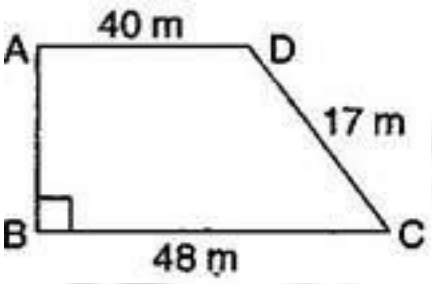


2. **The area of a trapezium is 34 cm^2 and the length of one of the parallel sides is 10 cm and its height is 4 cm.**



Find the length of the other parallel side.

3. Length of the fence of a trapezium shaped field ABCD is 120 m. If BC = 48 m, CD = 17 m and AD = 40 m, find the area of this field. Side AB is perpendicular to the parallel sides AD and BC.



CHAP 12

1. Evaluate:

(i) $\frac{8^{-1}\times 5^{3}}{2^{-4}}$ (ii) $\left(5^{-1}\times 2^{-1}\right)\times 6^{-1}$

2. **Find the value of** m **for which** $5^{m}\div 5^{-3}=5^{5}$.

3. Evaluate:

(i) $\left\{\left(\frac{1}{3}\right)^{-1}-\left(\frac{1}{4}\right)^{-1}\right\}^{-1}$ (ii) $\left(\frac{5}{8}\right)^{-7}\times\left(\frac{8}{5}\right)^{-4}$

CHAP 13

1. Which of the following are in inverse proportion:

(i) The number of workers on a job and the time to complete the job.

(ii) The time taken for a journey and the distance travelled in a uniform speed.

(iii) Area of cultivated land and the crop harvested.

(iv) The time taken for a fixed journey and the speed of the vehicle.

(v) The population of a country and the area of land per person.

2. A farmer has enough food to feed 20 animals in his cattle for 6 days. How long would the food last if there were 10 more animals in his cattle?

3. A contractor estimates that 3 persons could rewire Jasminder's house in 4 days. If, he uses 4 persons instead of three, how long should they take to complete the job?

CHAP 14

1. Factorize the following expressions:

(i) $a^2+8a+16$

(ii) $p^2-10p+25$

(iii) $25m^2+30m+9$

(iv) $49y^2+84yz+36z^2$

(v) $4x^2-8x+4$

(vi) $121b^2-88bc+16c^2$

2. Factorize:

(i) $4p^2-9q^2$

(ii) $63a^2-112b^2$

(iii) $49x^2-36$

(iv) $16x^5-144x^2$

3. Factorize:

(i) a^4-b^4 (ii) p^4-81

(iii) $x^4-(y+z)^4$ (iv) $x^4-(x-z)^4$

4. Factorize the followingexpressions:

(i) p^2+6p+8

(ii) $q^2-10q+21$

(iii) $p^2+6p-16$

PAPER FORMATE

SECTION - A

(i)Choose correct option **[1 x 10 = 10]**

(ii) Fill the blank **[1 x 10 = 10]**

(iii) Tell whether the statement is true or false: **[1 X 10 = 10]**

(IV) Solve: Each carry one marks **[1X 10 = 10]**

SECTION - B

Solve: Each carry two marks (Any four) **[2 X 8= 16]**

SECTION -C

Solve: Each carry three marks (Any one) **[3 X 8 = 24]**