N-E-P-S

Subject Maths — class 8th

Term 1st

Chapter

Square and Square root

1. Square :- A number raised to the power 2 is called the square of the number.
if a natural number m can be expressed as n^2, where n is also a natural number, then m is Square number
2. All Square numbers ends with 0, 1, 4, 5, 6, 9 at unit place.
3. Square numbers can only have even numbers of zeros at end.

Exercise 6.1 (P 103)

Q1. what will be the unit digit of the squares of the following numbers?

Sol:- (i)

81 The digit at one's place is $1=1$
799 The digit at ones place is $9=81$
3853 The digit at one's place is $3=9$
2638 The digit at one's place is $8=64$
55555 The digit at one's place is $5=25$

Q2. The following numbers are obviously not perfect square. Give reason.

(i) 1057 number ending in 7 are not Sq. no

Note:— All numbers ends with 2, 3, 7, and 8 are not Square no.

(v) number ending in odd numbers of zeros are not Square numbers.

(vi) Because the number at one's place is 2.

(vii) Because both (vi) and (viii) have odd number of zeros at the one's place.

(viii)

note :- The Square of an even number is even and the Square of an odd number is odd.

Q3. (i) 431 (iii) 7779

The Square of (i) and (iii) would be odd numbers.

Q 4, Q 5, Q 6, Q. 7

Do these questions on your text book.

Q Q.7 Express 49 as the Sum of 7 odd numbers.

Sol:- $49 = (7)^2$ = Sum of 1st 7 odd nos

$= 1+3+5+7+9+11+13.$

(iii) $121 = (11)^2$ = Sum of 1st 11 odd numbers.

$= 1+3+5+7+9+11+13+15+17+19+21$

Q 9:→ How many numbers lie between Square of

(i) 12 and 13.

Sol:- ∴ 2n numbers non perfect numbers lie between n^2 and $(n+1)^2$.

Here $n = 12$

$(n+1) = 13$

between n^2 and $(n+1)^2$ lie 2n numbers

$(12)^2$ and $(13)^2 = 2 \times 12 = 24$ numbers.

(iii) 99 and 100

$n = 99$, $(n+1) = 100$

Between the Square of 99 and Square of 100, 2n number lie between the two

$(99)^2$ and $(100)^2 = 2 \times 99 = 198$ numbers.

Note Do the remaining parts on class note book.

Exercise 6.2.

Q1. Find the Square of the following Nos. (3)

(i) $32 = (30+2)^2 = (30+2)(30+2)$

now multiply

$30(30+2) + 2(30+2)$

$900 + 60 + 60 + 4 = 1024$ Ans.

(ii) $35 =$ Solve your self.

(iii) $86 = (80+6)^2 = (80+6)(80+6)$

$80(80+6) + 6(80+6)$

$6400 + 480 + 480 + 36 = 7396$ Ans.

Solve the rest of parts.

Q2. Write a Pythagorean Triplet whose one number is (i) 6

Sol:- The Pythagorean Triplets are:

$2m, (m^2-1), (m^2+1)$

Sol:- let $m^2 - 1 = 6$

$m^2 = 6 + 1$

$m^2 = 7$

$m = \sqrt{7}$ it is not an integer

now let $m^2 + 1 = 6$

$m^2 = 6 - 1$ or $m^2 = 5$

which is not an integer

again $2m = 6$

$m = 6/2 = 3$ it is an integer

Thus $m^2 - 1 = 3^2 - 1 = 9 - 1 = 8$.

$m^2 + 1 = 3^2 + 1 = 9 + 1 = 10$.

Hence the required triplet is

6, 8, 10

Note Solve the remaining Parts.

Exercise 6.3:-

note:- The square of an even number is even and square of an odd number is odd.

Q1. What could be possible one's digit of the square root of each of the following

(i) 9801 The digit at one's place possible is 1 or 9

(ii) 99856 The digit at one's place possible is 4 or 6

(iii) 657666025 The digit at one's place possible is 5

$1^2 = 1$
$2^2 = 4$
$3^2 = 9$
$4^2 = 16$
$5^2 = 25$
$6^2 = 36$
$7^2 = 49$
$8^2 = 64$
$9^2 = 81$
$10^2 = 100$.

Q2. Without doing any calculation find the numbers which are surely not perfect squares.

(i) 153 (ii) 257 (iii) 408 are not surely perfect squares because the numbers ends with, 3, 7, 8 can never be a perfect square.

Q4. Find the square root of the following numbers by prime factorisation method.

(i) 729

$729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$

$729 = 3^2 \times 3^2 \times 3^2$

$729 = (3 \times 3 \times 3)^2$

$\sqrt{729} = 27$

3	729
3	243
3	81
3	27
3	9
	3

Ans

(iv) 400

2	400
2	200
2	100
2	50
5	25
	5

$400 = 2 \times 2 \times 2 \times 2 \times 5 \times 5$

$400 = 2^2 \times 2^2 \times 5^2$

$400 = (2 \times 2 \times 5)^2$

$400 = (20)^2$

$\sqrt{400} = 20$ Ans

(v) 7744

11	7744
11	704
2	64
2	32
2	16
2	8
2	4
	2

$7744 = 11 \times 11 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$7744 = 11^2 \times 2^2 \times 2^2 \times 2^2$

$= (11 \times 2 \times 2 \times 2)^2$

$7744 = (88)^2$

$\sqrt{7744} = 88$ Ans.

(vi) 9604

2	9604
2	4802
7	2401
7	343
7	49
	7

$9604 = 2 \times 2 \times 7 \times 7 \times 7 \times 7$

$9604 = 2^2 \times 7^2 \times 7^2$

$= (2 \times 7 \times 7)^2$

$9604 = (98)^2$

$\sqrt{9604} = 98.$

(vii) 9216

9216

2	9216
2	4608
2	2304
2	1152
2	576
2	288
2	144
2	72
2	36
2	18
3	9

$9216 = 2^3 \times 2^2 \times 2^2 \times 2^2 \times 2 \times 3^2$

$9616 = (96)^2$

(ix)

$529 = 23 \times 23$

$\sqrt{529} = 23$

Ans.

)3. Find the Square root of 100 by the method of repeated Subtration.
The odd numbers are
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, ------
for 100

100 − 1 = 99
99 − 3 = 96
96 − 5 = 91
91 − 7 = 84
84 − 9 = 75
75 − 11 = 64
64 − 13 = 51
51 − 15 = 36
36 − 17 = 19
19 − 19 = 0

The number 100 reduced to zero after Subtracting 10 consecutive odd numbers start from 1. Thus

$\sqrt{100} = 10$. Ans.

$(43)^2 = 165$

Q5. For each of the following numbers, find the smallest whole number by which it should be multiplied so that to get a perfect Square number. Also find Square root of the Sq. number.

Sol:- 252

$252 = \underline{2 \times 2} \times \underline{3 \times 3} \times 7$

2	252
2	126
3	63
3	21
	7

Hear no. 7 has no pair if we multiply B/s by no 7 we get

$7 \times 252 = \underline{2 \times 2} \times \underline{3 \times 3} \times \underline{7 \times 7}$

$1764 = 2^2 \times 3^2 \times 7^2$

$1764 = (2 \times 3 \times 7)^2$

$1764 = (42)$ or $\sqrt{1764} = 42$.

7, 42 Answer.

Page: Date:

(v) 1458

5

$1458 = 2 \times \underline{3 \times 3} \times \underline{3 \times 3} \times \underline{3 \times 3}$

2	1458
3	729
3	243
3	81
3	27
3	9
	3

no 2 has no pair multiply B/s by 2 to get perfect sq.

$1458 = 2 \times 2 \times \underline{3 \times 3} \times \underline{3 \times 3} \times \underline{3 \times 3}$

$1458 = 2^2 \times 3^2 \times 3^2 \times 3^2$

$1458 = (2 \times 3 \times 3 \times 3)^2$

$1458 = (54)^2$

$\sqrt{1458} = 54$ Sq root of 1458

2, 54 Ans:-

(vi) 768

2	768
2	384
2	192
2	96
2	48
2	24
2	12
2	6
	3

$768 = 3 \times \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2}$

$768 = 3 \times 2^2 \times 2^2 \times 2^2 \times 2$

768 Since 3 has no pair. multiply Both sides by 3 to get perfect Square!

$768 \times 3 = 3 \times 2^2 \times 2^2 \times 2^2 \times 2^2$

$2304 = (3 \times 2 \times 2 \times 2 \times 2)^2$

$2304 = (48)^2$

Sq root of 2304

$\sqrt{2304} = 48$ 3, 48 Ans

6:→ For each of the following numbers find the smallest whole no. by which it should be divided so as to get a perfect square. Also find the sq. root of the sq. number so obtained

(i) 252

2	252
2	126
3	63
3	21
	7

$252 = 2 \times 2 \times 3 \times 3 \times 7$

Since 7 has no pair to make the given number Divide B/s by 7

$\frac{252}{7} = \frac{2^2 \times 3^2 \times 7}{7}$

$36 = (2 \times 3)^2$

$36 = 6^2$ Sq root of 36

$\sqrt{36} = 6$

7, 6 Answer.

(vi) 1620

2	1620
2	810
3	405
3	135
3	45
3	15
	5

$1620 = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5$

$1620 = 2^2 \times 3^2 \times 3^2 \times 5^1$ no 5 has no pair Divide B/s by 5

$\frac{1620}{5} = 2^2 \times 3^2 \times 3^2 \times 5$

$324 = (2 \times 3 \times 3)^2 = (18)^2$

$\sqrt{324} = 18$ 5, 18 Ans.

7. for question see Text book.

Sol:- Let no. of students in class VIII = x
Let each student donates Rs x.
By Given condition

$x \times x = 2401$

$x^2 = 2401$

$x = \sqrt{2401}$

$x = \sqrt{7 \times 7 \times 7 \times 7}$

$x = \sqrt{7^2 \times 7^2}$

$x = \sqrt{(7)^2}$

$x = 49$

Total no. of students = 49.

Q9. Find the smallest sq. no. that is divisible by each of a number 4, 9, 10.

Sol:- First find L.C.M of 4, 9, 10.

2	4, 9, 10
2	2, 9, 5
9	1, 9, 5
5	1, 1, 5
	1, 1, 1

L.C.M = 2 × 2 × 9 × 5
= 180

now find prime factorisation of 180 i.e

2	180
2	90
3	45
3	15
	5

$180 = 2 \times 2 \times 3 \times 3 \times 5$

$180 = 2^2 \times 3^2 \times 5^1$

no 5 has no pair so it make it perfect sq. Multiply B/s by 5

$180 \times 5 = 2^2 \times 3^2 \times 5 \times 5$.

$900 = (2 \times 3 \times 5)^2$

$900 = (30)^2$ Sq root of 900

$\sqrt{900} = 30$ The number = 900.

Date:
Page:

Ex 6.4

1. Find the square root of each of the following numbers by division method

(i)
$$\begin{array}{r} 48 \\ 4\overline{)2304} \\ -16 \\ \hline 88\overline{)704} \\ 704 \\ \hline 0 \end{array}$$
$\sqrt{2304} = 48$ Ans

(iii)
$$\begin{array}{r} 59 \\ 5\overline{)3481} \\ -25 \\ \hline 109\overline{)981} \\ 981 \\ \hline 0 \end{array}$$
$\sqrt{3481} = 59$ Ans

(v)
$$\begin{array}{r} 3249 \\ 57 \\ 5\overline{)3249} \\ -25 \\ \hline 107\overline{)749} \\ -749 \\ \hline 0 \end{array}$$
$\sqrt{3249} = 57$ Ans

(vii)
$$\begin{array}{r} 5776 \\ 76 \\ 7\overline{)5776} \\ -49 \\ \hline 146\overline{)876} \\ 876 \\ \hline 0 \end{array}$$
$\sqrt{5776} = 76$ Ans

(ix)
$$\begin{array}{r} 576 \\ 24 \\ 2\overline{)576} \\ 4 \\ \hline 44\overline{)176} \\ 176 \\ \hline 0 \end{array}$$
$\sqrt{576} = 24$ Ans

(xi)
$$\begin{array}{r} 900 \\ 30 \\ 3\overline{)900} \\ 9 \\ \hline 60\overline{)000} \\ 000 \\ \hline 0 \end{array}$$
$\sqrt{900} = 30$ Ans.

Q2. Find the number of digits in the square root of each of the following numbers

(i) $\overline{64}$ The number of digits in the Square root is 1

(iii) $\overline{44}\,\overline{09}$ The number of digits in the Square root is 2.

(v) $\overline{39}\,\overline{06}\,\overline{25}$ The number of digits in the Square root is 3.

Q3:→ Find the Square root of the following decimal numbers.

(i)
$$\begin{array}{r} 2.56 \\ 1\overline{)2.56} \\ -1 \\ \hline 26\overline{)156} \\ 156 \\ \hline 0 \end{array}$$
$\sqrt{2.56} = 1.6$ Ans

(v)
$$\begin{array}{r} 5.6 \\ 5\overline{)31.36} \\ 25 \\ \hline 106\overline{)636} \\ 636 \\ \hline 0 \end{array}$$
$\sqrt{31.36} = 5.6$ Ans.

Q4. Find the least number which must be subtracted from the following numbers so as to get a perfect Square.

Sol:-(i) 402.
$$\begin{array}{r} 20 \\ 2\overline{)402} \\ -4 \\ \hline 40\overline{)02} \\ 0 \\ \hline 2 \end{array}$$
The remainder is 2
So Subtract 2 from 402 to make it perfect Square.
$402 - 2 = 400$
$\sqrt{400} = 20$ Ans.

4000
$$\begin{array}{r} 63 \\ 6\overline{)4000} \\ -36 \\ \hline 123\overline{)400} \\ -369 \\ \hline 31 \end{array}$$
The remainder is 31
Sub. 31 from 40000
$40000 - 31 = 3969$
$\sqrt{3969} = 63$ Ans.

Q5:- Find the least number which must be added to the following nos so as to get perfect square.

(i) 525

Sol:-
$$\begin{array}{r} 22 \\ 2\overline{)525} \\ -4 \\ \hline 42\overline{)125} \\ 84 \\ \hline 41 \end{array}$$

Remainder = 41

$22^2 = < 525$

next perfect sq. no $= 23^2$

$23^2 = 529$

Hence $529 - 524 = 4$

4 must be added to 529 to get perfect square.

(ii) 1750

$$\begin{array}{r} 41 \\ 4\overline{)1750} \\ -16 \\ \hline 81\overline{)150} \\ -81 \\ \hline 69 \end{array}$$

Remainder = 69

$41^2 < 1750$

next perfect no $= 42^2 = 1764$

Hence $1764 - 1750 = 14$

14 must be added to 1750 to get perfect sq.

$1750 + 14 = 1764 = \sqrt{1764} = 42$

(v) 6412

$$\begin{array}{r} 80 \\ 8\overline{)6412} \\ -64 \\ \hline 160\overline{)12} \\ 00 \\ \hline 12 \end{array}$$

Remainder = 12

$80^2 < 6412$

next perfect no $= 81^2 = 6561$

Hence $6561 - 6412 = 149$

149 must be added 6412 to get perfect no.

$6412 + 149 = 6561$

$\sqrt{6561} = 81$

Q6:- Find the length of one side of a square whose area $= 441 m^2$

Sol:- Let each side of square $= x$.

Area of Square $= l \times b$.

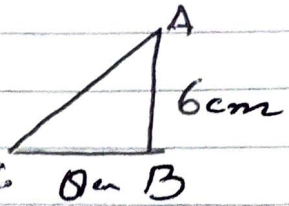
$441 = x \times x$

$441 = x^2$ or $x = \sqrt{441} = 21m$

each side is $21m$.

7. In a rt. Ld $\triangle ABC$ $\angle B = 90^\circ$

a) if $AB = 6cm$
$BC = 8cm$
$AC = ?$



By using pythagoras theorm we have:

$(Hyp)^2 = (Base)^2 + (\perp)^2$

$AC^2 = BC^2 + AB^2$

$AC^2 = 8^2 + 6^2$

$= 64 + 36 = 100$

$AC^2 = 100$ or $AC = \sqrt{100}$

$AC = 10cm$. Ans.

Q 9

Total no. of children in a school $= 500$

Prime factorisation of $500 = 2 \times 2 \times 5 \times 5 \times 5$

2	500
2	250
5	125
5	25
5	5
	1

Since 5 has no pair
Hence 5 children would be left out in an arrangement.

Cube and cube root.

Exercise 7.1

Q1 Which of the following numbers are not perfect cube.

(i) 216

$216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$.

$216 = 2^3 \times 3^3$

$= (6)^3$

Yes it is perfect cube.

2	216
2	108
↓	↓
2	54
3	27
3	9
3	3
	1

(i) 128

2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$128 = \underbrace{2\times2\times2}\times\underbrace{2\times2\times2}\times2$

$= 2^3 \times 2^3 \times 2^1$

2 does not appear in the group of three

Hence 128 is not a perfect cube.

Note:- Solve the rest of parts same way.

Q2 Find the smallest number by which each of the following numbers must be multiplied to get perfect cube.

(i) 243

Prime factorisation

3	243
3	81
3	27
3	9
3	3
	1

$243 = \underbrace{3\times3\times3}\times\underbrace{3\times3}\times3 = 3^3 \times 3^2$

The prime factor 3 does not appear in a group of three. So multiply 3's by 3 to get perfect cube.

$243 \times 3 = \underbrace{3\times3\times3}\times\underbrace{3\times3\times3}$

$= 3^2 \times 3^2$

729

$729 = (9)^3$ Hence 729 is a perfect cube

(iii) 72.

2	72
2	36
2	18
3	9
3	3
	1

$72 = 2\times2\times\underbrace{2\times3\times3} = 2\times3^2$

multiply 3's by 3 to get perfect cube

$729 \times 3 = \underbrace{2\times2\times2}\times\underbrace{3\times3\times3}$

$216 = (2\times3)^3 = 6^3$

which is perfect cube.

100

2	100
2	50
5	25
5	5
	1

$100 = 2\times2\times5\times5 = 2^2\times5^2$

The prime factor 2 and 5 do not appear in group of three

To make 100 perfect cube multiply B/s by 2 and 5 = 10.

$100\times10 = 2\times2\times2\times5\times5\times5$

$1000 = 2^3\times5^3$

$1000 = (10)^3$

1000 is a perfect cube.

Q3. Find the smallest number by which each of the following numbers must be divided to get perfect cube.

(i) 81

3	81
3	27
3	9
3	3
	1

$81 = 3\times3\times3\times3 = 3^3\times3^1$

Here 3 does not appear in group of 3.

So divide B/s by 3 to get perfect cube.

$\frac{81}{3} = \frac{3^3\times3}{3}$

$27 = 3^3$ Hence 27 is a perfect cube.

(ii) 135

3	135
3	45
3	15
5	5
	1

$135 = 3\times3\times3\times5^1 = 3^3\times5^1$

5 does not appear in the group of 3. So divide B/s by 5.

$\frac{135}{5} = \frac{3^3\times5}{5} = 3^3$

$27 = 3^3$ it is a perfect cube.

704

2	704
2	352
2	176
2	88
2	44
2	22
11	11
	1

$704 = 2\times2\times2\times2\times2\times2\times11$

$= 2^3 \times 2^3 \times 11^1$

$704 = 2^3 \times 2^3 \times 11^1$

11 does not appear in the group of 3 so divide by 11 to get perfect cube.

$\frac{704}{11} = \frac{2^3 \times 2^3 \times 11}{11}$

$64 = 2^3 \times 2^3 = (2\times2)^3 = 4^3$

64 is a perfect cube.

Q4:→ length of cuboid = 5cm.
breadth of cuboid = 2cm.
height of cuboid = 5cm.
volume of cuboid = $l \times b \times h$
$= 5cm \times 2cm \times 5cm$

Here we see that 5^2 and 2^1 do not appear in the group of three so multiple it by $2\times5\times2 = 20$. So 20 cuboids are required to make it a perfect cube.

Exercise 7.2

Q1. Find the cube root of each of the following numbers by prime factorisation method.

64

2	64
2	32
2	16
	8

2	8
2	4
2	2
	1

$64 = 2\times2\times2\times2\times2\times2$

$64 = 2^3 \times 2^3 = (4)^3$

Cube root of $64 = 4$ Ans.

note :→

Comparing Quantities

(i) if Cost Price > Selling Price = Loss

(ii) if Selling Price > Cost Price = Profit

(iii) $\text{Profit \%} = \frac{\text{Profit}}{\text{C.P}} \times 100$

(iv) $\text{Profit} = \frac{\text{C.P} \times \text{Profit \%}}{100}$

(v) $\text{S.P} = \frac{\text{C.P} \times (100 + \text{Profit \%})}{100}$

(vi) $\text{S.P} = \frac{\text{C.P} \times (100 - \text{Loss \%})}{100}$

(vii) $\text{C.P} = \frac{100 \times \text{S.P}}{(100 + \text{Profit \%})}$

(viii) $\text{C.P} = \frac{100 \times \text{S.P}}{(100 - \text{Loss \%})}$

(x) Discount = Marked Price − Over

(xi) Discount = Discount % of Marked Price

Note: Loss or gain is always Calculated on Cost Price.

Exercise 0.1

Q1. Sol:- Ratio of speed of cycle to speed of scooter = 15 : 30

$15 : 30 = 1 : 2$ Ans

b) 5m to 10km

Change Km into m.

1 Km = 1000 m

10 Km = 10 × 1000 = 10000 m

Ratio between 5m to 10000m

5m : 10000 m

$5 : 10000 = 1 : 2000$ Ans.

Q2. Convert the following ratio to percentage

a) 3 : 4

Sol:-

Fraction $= \frac{3}{4}$

$\% = \frac{3}{4} \times \frac{25}{25}$

$= \frac{75}{100} = 75\%$

b) 2 : 3

Sol:-

Fraction $= \frac{2}{3}$

$\% = \frac{2}{3} \times \frac{100}{100}$

$= \frac{200}{300} = \frac{200}{3} \times \frac{1}{100}$

$= \frac{200}{3}\% = 66\frac{2}{3}\%$

Q4:→

Winning % = 40%

Let total number of matches played = x

i.e ∴ no of matches won = 10

40% of x = 10

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

$x = \frac{10 \times 100}{40} = 25$ matches Ans.

Q6. Total no. of people = 50 Lakh
Total Percent = 100
Ace Q/C
60% people like Cricket
30% people like football
people who like other game
$100 - (60+30) = 100 - 90 = 10\%$

no of people like cricket =
60% of 50 lakh
$= \frac{60}{100} \times 50 \text{ lakh} = \underline{30 \text{ lakh}}$

no of people like football = 30% of 50 lakh
$= \frac{30}{100} \times 50 \text{ lakh} = \underline{15 \text{ lakh}}$

no of people like other games =
10% of 50 lakh.
$\frac{10}{100} \times 50 \text{ lakh} = \underline{5 \text{ lakh}}$

Exercise 8.2

Q1. new salary = Rs 154000
Sol:- 10% increase in salary means
if previous Salary is Rs 100 the increased Salary = Rs (100+10) = 110
if new salary is 110 then original Salary = Rs 100
if new salary is Rs 1 then original Salary = $\frac{100}{110}$
if new Salary is Rs 154000 then original Salary = $\frac{100}{110} \times 154000$

$= \text{Rs } 140000$ Ans

Q5. Cost price of 80 articles = Rs 2400

Cost price of 1 article = $\frac{2400}{80} = Rs\ 30$

C.P = Rs 30

Profit = 16%.

$\therefore S.P = \frac{CP \times (100 + gain\%)}{100}$

$= \frac{30 \times (100 + 16)}{100} = \frac{30 \times 116}{100}$

$= \frac{348}{10} = Rs\ 34.80$ Ans:-

Q6. → 10% discount on Marked price (M.P)

if article marked price is Rs 100 then selling price = (100 - 10) = Rs 90

if M.P is 100 S.P = Rs 90

M.P is 1 S.P = $\frac{90}{100}$

M.P is 1450 S.P = $\frac{90}{100} \times 1450$

$= Rs\ 1305$

if M.P is 1700 then S.P = $\frac{90}{100} \times 1700$

$= Rs\ 1530$

Two shirts M.P = 850 × 2 = Rs 1700

Costomers has to pay for jeans and two shirts = (1305 + 1530)

= Rs 2835.

Q8. → Price of TV = Rs 13000

Sale tex charge = 12%

Sale tex on TV = 12% of Rs 13000

$= \frac{12}{100} \times 13000$

$= Rs\ 1560$

Amount paid = (13000 + 1560)

= Rs 14560 Ans.

10:→ 8% VAT included means
Rs 8 is added to original Price @ 100
if included VAT price is 108
then original price = Rs 100.
if included VAT price = Rs 5400
original price = $\frac{100}{108} \times 5400$
= Rs 5000.
Price Before VAT = Rs 5000.
Ans

Exercise 8.3

$A = P\left(1 + \frac{r}{100}\right)^n$ when compounded annually

where A = amount, P = Principal
r = Rate of intrest and n
is no. of years of
T or n = time period.

C.I = A − P
Amount when calculated half yearly R = R/2 half yearly.
n = 2n no. of half years
Half the rate double the time

Q1:→ Given:−
P = Rs 10800, T = 3 yrs, R = 12½%
= 25/2 %

$A = P(1 + r/100)^T$

$A = 10800\left(1 + \frac{25}{2} \times \frac{1}{100}\right)^3$

$= 10800\left(1 + \frac{1}{8}\right)^3 = 10800 \times \left(\frac{9}{8}\right)^3$

$$A = 10000 \times \frac{9}{8} \times \frac{9}{8} \times \frac{9}{8}$$

$$A = 15377.34 \text{ Rs}$$

$$C.I = A - P$$

$$C.I = 15377.34 \text{ Rs} - 10000 \text{ Rs}$$

$$C.I = 4577.34 \text{ Rs}$$ Answer

Q3:- In case of Saba

$P = Rs\ 12500$

$R = 12\%$ Per annum

$T = 3$ years.

$$S.I = \frac{P \times T \times R}{100}$$

$$= \frac{12500 \times 3 \times 12}{100}$$

$$= Rs\ 4500$$

In case of Rabiya.

$P = Rs\ 12500$

$R = 10\%$

$T = 3$ years

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

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

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

$$= 12500 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$$

$$A = Rs\ 16637.50$$

$$C.I = A - P$$

$$= 16637 \text{ Rs} - 12500$$

$$= Rs\ 4137.50.$$

We see Sabina will pay more interest by $(4500 - 4137.50) = Rs\ 362.50$ Ans.

Q9:- Given :- $P = Rs\ 4096$, $R = 12\frac{1}{2}\%$, $R = \frac{25}{2}\%$, $T = 18$ months $=$ 3 Half years

half yearly

$$A = P\left(1 + R/100\right)^T$$

$$A = 4096\left(1 + \frac{25}{2 \times 100}\right)^3$$

$$= 4096 \times \frac{9}{8} \times \frac{9}{8} \times \frac{9}{8}$$

$A = 10000 \times \frac{9}{8} \times \frac{9}{8} \times \frac{9}{8}$.

$A = Rs\ 15377.34$

$C.I = A - P = 15377.34 - Rs\ 10000$

$C.I = \underline{Rs\ 5377.34}$ Ans.

Q3. For Sabina

$P = Rs\ 12500$

$R = 12\%$

$T = 3$ yrs.

$S.I = \frac{P \times T \times R}{100}$

$= \frac{12500 \times 3 \times 12}{100}$

$= Rs\ 4500$

For Rabiya.

$P = Rs\ 12500$

$R = 10\%$

$T = 3$ yrs.

$C.I = P\left(1 + \frac{r}{100}\right)^T - P$

$C.I = 12500\left(1 + \frac{10}{100}\right)^3 - P$

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

$= 12500 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} - P$

$C.I = Rs\ 16637.50 - 12500$

$C.I = Rs\ 4137.50$

Sabina's intrest is more than Rabiya.

Sabina has to pay more intrest by

$(4500 - 4137.50) = \underline{Rs\ 362.50}$

(e)

Q5:→ $P = Rs\ 60,000$

$R = 12\%$ per annum Compounded half yearly $= 6\%$ half yearly

$T = 6$ months $= 1$ half year.

$A = P\left(1 + \frac{r}{100}\right)^T$

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

$= 60000 \times \frac{106}{100} = Rs\ 63600$

$A = Rs\ 63600$

Q7: → (i) P = Rs 8000, T = 2 yrs, R = 5%

Amount after 2 yrs = $A\left(1+\frac{R}{100}\right)^T$

$$A = 8000\left(1+\frac{5}{100}\right)^2$$

$$= 8000\left(1+\frac{5}{100}\right)^2$$

$$= 8000 \times \frac{21}{20} \times \frac{21}{20}$$

$$A = 8000 \times \frac{21}{20} \times \frac{21}{20} = Rs\ 8820$$

∴ Amount credited after 2 yrs = Rs 8820

(ii) Amount after 3 years.

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

$$A = 8000\left(1+\frac{5}{100}\right)^3$$

$$= 8000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} = Rs\ 9261$$

Interest after 3rd year = Rs (9261 − 8820)

= Rs 441 Ans:—

Q9:- P = Rs 4096

T = 10 months

= 3 half years

$R = 12\frac{1}{2}\%$ per annum

$= \frac{25}{2}\%$

$R = \frac{25}{2} \times 1\%$ half year

$= \frac{25}{4}\%$

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

$$= 4096\left(1+\frac{25}{4\times 100}\right)^3$$

$$= 4096 \times \frac{17}{16} \times \frac{17}{16} \times \frac{17}{16} = Rs\ 4913$$ Ans

Q12. P = Rs 42000

T = 1 year

R = 8% per annum

$$A = P\left(1-\frac{R}{100}\right)^T$$

$$A = 42000\left(1-\frac{8}{100}\right)^{\frac{2}{25}\times\frac{1}{1}}$$

$$= 42000 \times \left(1-\frac{2}{25}\right)$$

$$= 42000 \times \frac{23}{25}$$

$$= Rs\ 38640$$ Ans.