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Monday

Ch-1 Natural Numbers and Whole Numbers

★ Start Points

1. Number denotes the idea of a thing
2. Numeral is the symbol to denote the idea.
3. For example 'Two' is the name of the number and '2' is the symbol to denote the number
ie. 2 is a numeral
4. Our numerals are called Hindu-Arabic numerals

5. We use 10 symbols for our numerals, namely 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. called the digits

MHW in CW
With (E)
Ex 1.2 abc

6. There are two values of each digit: Place value and Face value.

7. For example in ^{HTO} 824

The face value in 824 is eight

The place of 8 in 824 is Hundred

The place value of 8 in 824 is 800.

8. Emptiness or Nothingness is denoted by a symbol '0' (Zero or Shunya)

9. The numbers 1, 2, 3, ... are called Natural Numbers.

10. The numbers 0, 1, 2, 3, ... are called Whole numbers.

Exercise 1.1

Given Numeral $\rightarrow$ ^{Lth} Th ^{Hth} ^{T^h} ^O
134567

Face value of digit in

a) Thousands place $\rightarrow$ 4

b) Hundreds place $\rightarrow$ 5

c) One's place $\rightarrow$ 7

2)	Numerical	Place	Place value
a)	^{T O} 7 3	Tens	70
b)	^{H T O} 1 7 5	Tens	70
c)	^{H T O} 7 0 5	Hundreds	700
d)	^{TH HT O} 7 1 2 3	Thousands	7000
e)	^{L TH TH H T O} 7 6 1 2 0 0	Lakhs	7 00 000

3) Numerical is 547305

	L	TH	TH	H	T	O
	5	4	7	3	0	5

Digit in

a) ~~5~~ Ten Thousands place $\rightarrow$ 4

b) Tens place $\rightarrow$ 0

c) Thousands place $\rightarrow$ 7

d) Hundreds place $\rightarrow$ 3

4) Find the difference in the face value and place value of 5 in 1205341

TL	L	TH	TH	H	T	O
1	2	0	5	3	4	1
					49910	

Place value of 5 $\rightarrow$ ~~5000~~

Face value of 5 $\rightarrow$ ~~0005~~

Their difference $\rightarrow$ 4995

5) Find the difference of two sevens in

9	7	4	2	0	7	5
TL	L	TH	TH	H	T	O
9	7	4	2	0	7	5

Place value of 1st 7 $\rightarrow$ ~~7000~~

Place value of 2nd 7 $\rightarrow$ 70

699930

Exercise 1.2

Q

Que-1 Write in expanded notation

d)

TL	L	TH	TH	H	T	O
6	5	3	0	0	7	9

= $6 \times 10,00,000 + 5,00,000 +$
~~300,000~~ $3 \times 10,000$

e)

C	TL	L	TH	TH	H	T	O
8	0	0	6	0	8	0	8

= $8 \times 1,00,00,000 + 6 \times 10,000 +$
 $8 \times 100 + 8 \times 1$

f)

C	TL	L	TH	TH	H	T	O
9	0	7	1	0	6	0	8

= $9 \times 1,00,00,000 + 7 \times 1,00,000 +$
 $1 \times 10,000 + 6 \times 100 + 8 \times 1$

H.W Que-1

TH TH H T O

(a) 67345

$$= 6 \times 10,000 + 7 \times 1,000 + 3 \times 100 + 4 \times 10 + 5 \times 1$$

TL L TH TH H T O

(b) 5700005

$$5 \times 10,00,000 + 7 \times 1,00,000 + 5 \times 1$$

L TH TH H T O

(c) 750078

$$7 \times 1,00,000 + 5 \times 10,000 + 7 \times 1,000 + 8 \times 1$$

Ex-1.2

Que-2 Write numeral for:

MHW in CW

Pg No 8 & 9
with (B)

a) $3 \times 10,00,000 + 5 \times 10,000 + 7 \times 100 + 9 = 30,00,000$

$$\begin{array}{r} + 50,000 \\ + 700 \\ + 9 \\ \hline 50,709 \end{array}$$

b) $5 \times 1,00,000 + 7 \times 100 + 9 = 50,000$

$$\begin{array}{r} + 700 \\ + 9 \\ \hline 50,709 \end{array}$$

The Indian System of Numeration

PLACE → NAMES	M.H									
	TEN ARABS	ARABS	TEN CRORES	CRORES	TEN LAKHS	LAKHS	TEN THOUSANDS	THOUSANDS	HUNDREDS	TENS ONES
PERIOD → NAMES	ARABS		CRORES		LAKHS		THOUSANDS		ONES	

(c) $7 \times 10,00,000 + 7 \times 100,000 + 9 \times 10 = 70,00,000 + 7,00,000 + 90 = 77,00,090$

The International System

ONES	ONES
TENS	
HUNDREDS	
THOUSANDS	THOUSANDS
TEN THOUSANDS	
HUNDRED THOUSANDS	
MILLIONS	MILLIONS
TEN MILLIONS	
HUNDRED MILLIONS	
BILLIONS	BILLIONS
TEN BILLIONS	
HUNDRED BILLIONS	
TRILLIONS	TRILLIONS
TEN TRILLIONS	
HUNDRED TRILLIONS	

M.H

★ Points

- ① We have Indian System of numeration and International system of numeration.
- ② In Indian System we ^{have} groups of 3, 2, 2, 2
- ③ In International system we have groups of 3, 3, 3, 3
- ④ We know

100 thousand	= 1 lakh
1 Million	= 10 lakhs
10 Million	= 1 crore
100 Million	= 10 crores
1 Billion	= 1 Arab

MHW in CW
with (B) Ex 1.3
Q.1 abc + Q.2 ab,
de

Ex. 1.3

Que 1 → Write number names

A T C T L T H T H T O
d) 9, 20, 72, 00, 005

⇒ ~~9 Arab~~

⇒ Nine Arab, twenty crore, Seventy two lakh and five.

e) 9 B H T M M H T H T H T O
9, 207 200, 005

⇒ Nine Billions, Two hundred and seven million, Two hundred thousand and five.

f) H T M T M M H T H T H T O
454, 536, 005

⇒ Four hundred fifty four million, five hundred thirty six thousand, six thousand and five.

Que 2 → Write down the numerals of:

(c) Two Billion, three hundred thousand

⇒ B H T M M H T H T H T O
2, 000, 300, 000

Que-2 → (a) Sixty thousand, eight hundred
sixty three.

→ TH TH H TO
60, 863

(b) Seven Arab, ten.

→ A TCC TLL TH TH H TO
7, 00, 00, 00, 010

(c) Twenty crore, thirty lakh, forty

→ TCC TLL TH TH H TO
20, 30, 00 040

(d) Three hundred million, six thousand

→ HTM THM TH TH TH H TO
300, 006, 000

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Que-3 →

Ex - 1.3 Pg. 10

MHW in CW

Ex 1.3 3a (B)

b) Indian System → C TLL TH TH H TO
7, 00, 05, 050
Seven crore, five thousand and
fifty.

International System → TM M TH TH H TO
70, 005, 050
Seventy million five thousand
and fifty

c) Indian System → TCC TLL TH TH H TO
17, 05, 00, 004
Seventeen crore, five lakh and
four

International System → HTM THM TH TH TH H TO
170, 500, 004
One hundred seventy million, five
hundred thousand and four.

Que-4 Write numerals for

7.) $8 \times 10^5 + 6 \times 10^4 + 5 \times 10^2$

$$= 8 \times 100000 + 6 \times 10000 + 5 \times 100$$

800000

60000

500

$$= 8,60500$$

2.) $9 \times 10^6 + 7 \times 10^4 + 5 \times 10^2$

$$9 \times 1000000 + 7 \times 10000$$

$$5 \times 100 \quad 90000000$$

+ 70000

500

$$= \underline{9070500}$$

Q-5 How many lakhs make a million.

$$\begin{array}{ccccccc}
 & & & 1 & & & \\
 & & & \text{M} & \text{HTH} & \text{TH} & \text{H} & \text{T} & \text{O} \\
 \text{#} & & \text{#} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} \\
 & & & \text{TL} & \text{L} & \text{HTH} & \text{TH} & \text{H} & \text{T} & \text{O}
 \end{array}$$

Ans $\Rightarrow$ 10 lakhs make one million.

b) How many millions make 3 crores.

C T L T T H T 0
5 0 | 0 0 0 0 0 0
 T M M | H T T T T H T 0

Ans $\rightarrow$ 50 millions make 5 crores.

c) How many thousands in 4 lacs.

	L	TH	TH	H	T	O
	4	0	0	0	0	0
	TH	TH	TH	H	T	O

Ans $\rightarrow$ 400 thousands make 1 lakh.

Exercise 1.4

Q-2 Give successor of (+1)

- a) $1450500 \rightarrow 1450500 + 1 = 1450501$
 b) $1234099 \rightarrow 1234099 + 1 = 1234100$

Q-3 $\rightarrow$ Give predecessor of (-1)

- a) $327593 \rightarrow 327593 - 1 = 327592$
 b) $1277000 \rightarrow 1277000 - 1 = 1276999$

H.W.

Exercise 1.3

Que-3 $\rightarrow$

TL	L	TH	TH	H	T	O
----	---	----	----	---	---	---

(a) Indian System $\rightarrow$ 17,56,732
 Seventeen lakhs, sixty six thousand, seven hundred thirty two.

que-4 Write numerals for

2) $8 \times 10^5 + 6 \times 10^4 + 5 \times 10^2$

$$= 8 \times 100000 + 6 \times 10000 + 5 \times 100$$

200000

60000

500

8,605.00

2) $9 \times 10^6 + 7 \times 10^4 + 5 \times 10^2$

$$9 \times 1000000 + 7 \times 10000$$

$$5 \times 100 \quad 9000000$$

+ 70000

500

$$= 9070500$$

Ex-5 How many lakhs make a million.

$$\begin{array}{cccccccc}
 & & & & 1 & & & \\
 & & & & \text{M} & \text{H} & \text{H} & \text{H} & \text{H} & \text{T} & \text{O} \\
 \text{#} & & \text{#} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} \\
 & & & \text{TL} & \text{L} & \text{H} & \text{H} & \text{H} & \text{H} & \text{T} & \text{O}
 \end{array}$$

Ans $\Rightarrow$ 10 lakhs make one million.

b) How many millions make 3 crores.

$$\begin{array}{cccccccc}
 & & 1 & & & & & \\
 C & T & L & T & T & H & T & 0 \\
 5 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 \hline
 T & M & H & T & T & T & H & T & 0
 \end{array}$$

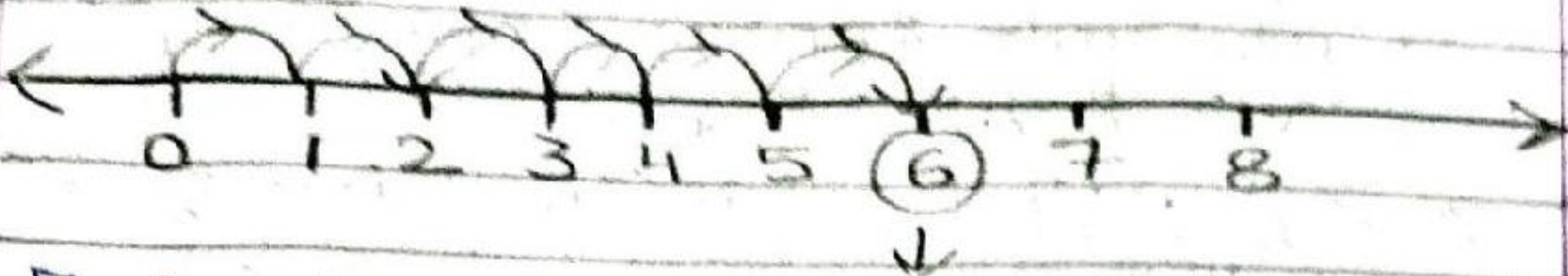
Ans $\rightarrow$ 50 millions make 5 crores.

Ex → 1.4 Pg. 11

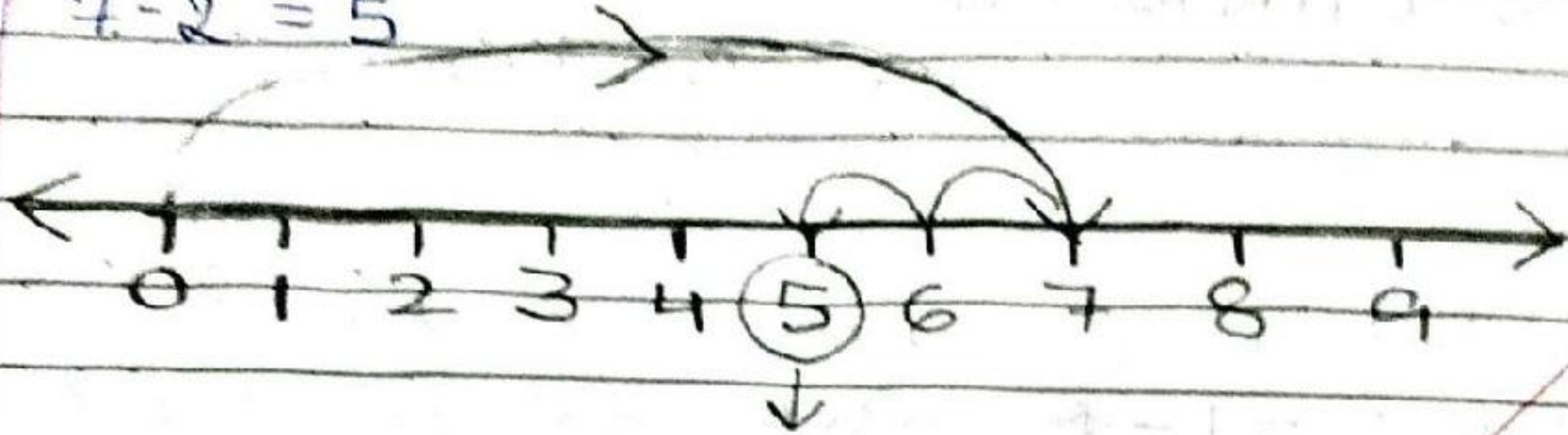
Ques 1 Draw the number line and illustrate.

MHW in CW
Ex 1.4 1. b, d

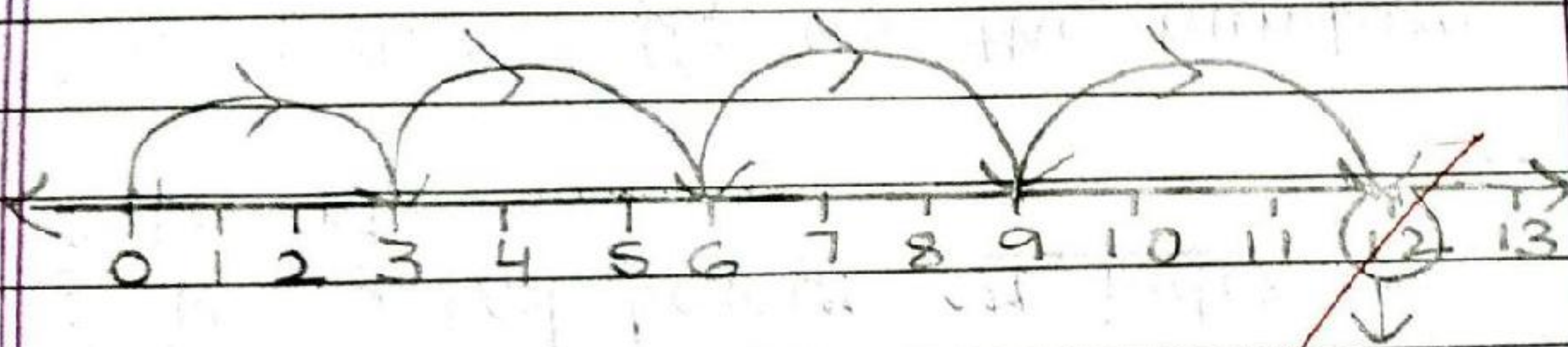
(a) $2 + 4 = 6$



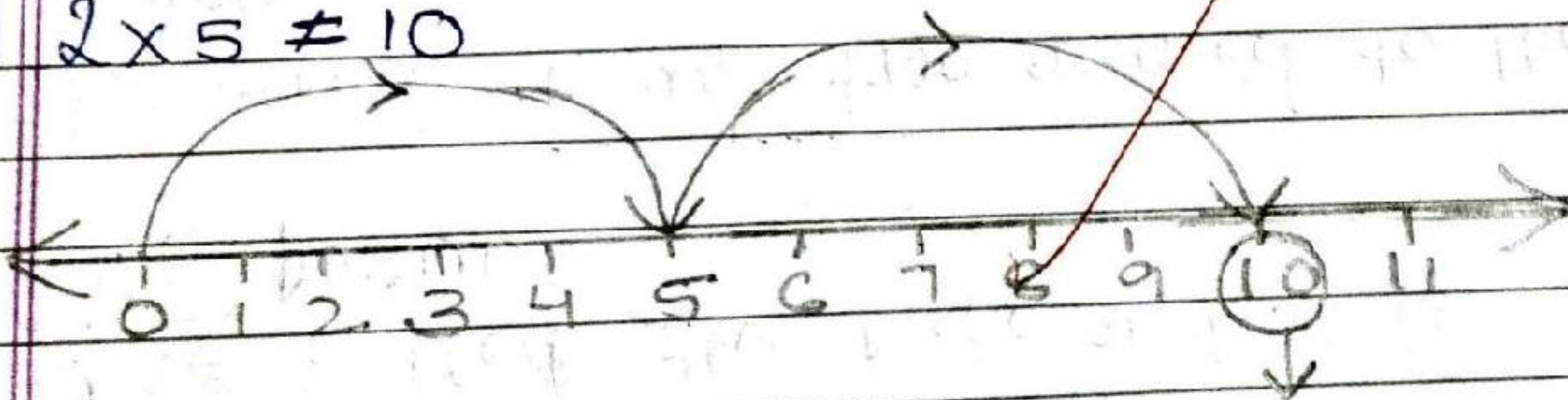
(c) $7 - 2 = 5$



(e) $4 \times 3 = 12$



(f) $2 \times 5 = 10$



* Points Exponential Notation

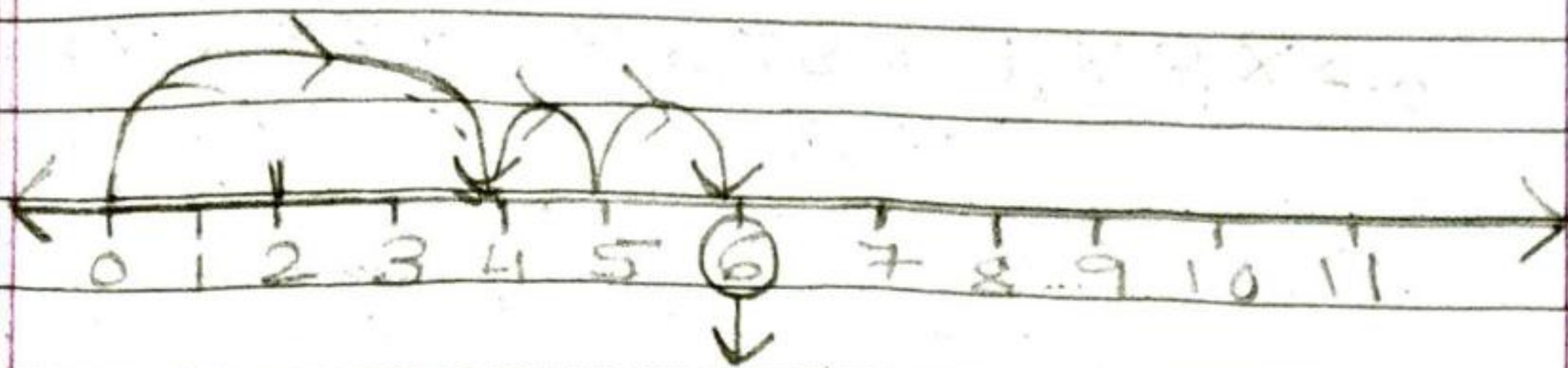
1. $8 = 2 \times 2 \times 2 = 2^3$
2. 2 is called the base and 3 is its power.
3. We read it as "two raised to the power 3"
4. 3 is called power or index or exponent.
5. The index tells us the number of times a particular number is multiplied.
6. If the power is 2, it is called square.
- If the power is 3, it is called cube.

Exercise $\rightarrow$ 1.5

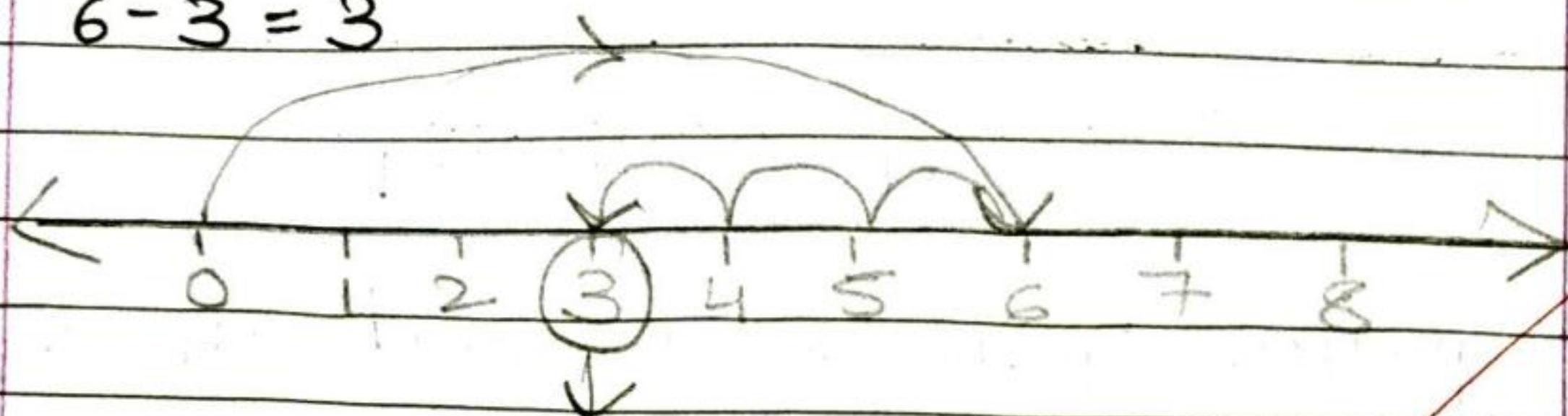
Ex-1 Express

- a) $3 \times 3 \times 3 \times 2 \times 2 = 3^3 \times 2^2 = 2^2 \times 3^3$
- b) $2 \times 2 \times 3 \times 3 \times 2 \times 5 \times 5 \times 5 = 2^3 \times 3^2 \times 5^3$
- c) $4 \times 4 \times 3 \times 3 \times 3 = 4^2 \times 3^3$
- d) $7 \times 7 \times 3 \times 5 \times 5 \times 5 = 7^2 \times 3^1 \times 5^3$

(b) $4 + 2 = 6$



(d) $6 - 3 = 3$



Ex $\rightarrow 1.5$ Pg - 12

Que-2 Write down values of -

a) $2 \times 5^2 = 2 \times 5 \times 5 = 50$

b) $3^2 \times 4^2 = 3 \times 3 \times 4 \times 4 = 9 \times 16 = 144$

c) $2^5 \times 3 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 = 96$

d) $11^2 \times 2 = 11 \times 11 \times 2 = 121 \times 2 = 242$

Que-3 Write squares of

a) ~~9 x 9~~ $9 \rightarrow 9^2 = 9 \times 9 = 81$

b) $14 \rightarrow 14^2 = 14 \times 14 = 196$

c) $15 \rightarrow 15^2 = 15 \times 15 = 225$

d) $16 \rightarrow 16^2 = 16 \times 16 = 256$

e) $24 \rightarrow 24^2 = 24 \times 24 = 576$

f) $25 \rightarrow 25^2 = 25 \times 25 = 625$

14

$\times 14$

56

14 x

196

32

2

15

$\times 15$

75

15 x

225

3

16

$\times 16$

196

16 x

256

Ques-4 Write cubes of

a) $2^3 \rightarrow 2 \times 2 \times 2 = 8$

b) $3^3 \rightarrow 3 \times 3 \times 3 = 27$

c) $5^3 \rightarrow 5 \times 5 \times 5 = 125$

d) $7^3 \rightarrow 7 \times 7 \times 7 = 343$

e) $10^3 \rightarrow 10 \times 10 \times 10 = 1000$

f) $20^3 \rightarrow 20 \times 20 \times 20 = 8000$

Ex - 1.6

1. The place value of 7 in 37563
is $\rightarrow$ $\begin{array}{ccccc} & \text{TH} & \text{TH} & \text{H} & \text{T} & \text{O} \\ 3 & 7 & 5 & 6 & 3 & \\ & = 7000 & & & & \end{array}$

2. The face value of 6 in $\begin{array}{ccccc} & \text{TH} & \text{H} & \text{T} & \text{O} \\ 3 & 6 & 4 & 5 & \\ & = 6 & & & \end{array}$
is 6

3. The smallest natural number is 1.

4. One million equals to 10 lakhs.

5. 1 crore equals to 100 lakhs.

6. Greatest no formed by digits 2, 3, 1, 8 is 8321.

7. Least whole no is 0.

8. How many nos from 1300 to 15300?

$$\begin{array}{r} 15300 \\ - 1299 \\ \hline 14001 \end{array}$$

$\rightarrow$ There are 14001 nos from 1300 to 15300

Chapter - 2 Operations on Whole Nos

★ Points

1. The four ~~fa~~ fundamental operations of mathematics are $(+)$, $(-)$, $(\times)$, $(\div)$

2. Properties of Addition

If ~~a and~~, ~~b and~~ ~~c~~ are whole nos, then

i) $a + b = b + a \rightarrow$ Commutative property

ii) $a + b$ is a whole no $\rightarrow$ Closure property

ii) $a + (b + c) = (a + b) + c \rightarrow$ Associative property

3. Properties of ^{two} subtraction

i) The difference of [^]whole nos is sometimes closed
 $a - b = c$ is not always a whole no.

ex $\rightarrow 8 - 5 = 3$ is a whole

no.

but $5 - 8 = -3$ is not a whole no.

ii) Subtraction is not commutative
 $a - b \neq b - a$ ex. $\rightarrow 8 - 5 \neq 5 - 8$

iii) Subtraction is not associative.
 $a - (b - c) \neq (a - b) - c$

Exerc 2.1

Que-1 (a) $7 + 3 = 3 + 7 \rightarrow$ Addition is commutative

(b) $7 - 3 \neq 3 - 7 \rightarrow$ Subtraction is not commutative

(c) $7 + 8 = 15 \rightarrow$ Addition is closed

(d) $7 - 8$ is not a whole no $\rightarrow$ Whole nos are not closed for subtraction.

(e) $10 + (3 + 7) = (10 + 3) + 7 \rightarrow$
Associative property

(f) $18 - 9 = 9$ Subtraction in whole nos is sometimes closed.

Que-2 (a) Simplify by using properties

$$a) 425 + 18 + 3 + 75 + 12 + 3$$

$$= \underline{425 + 75} + \underline{18 + 12} + 3$$

$$= 500 + 30 + 3$$

$$= 533$$

Units digit easy to add

$$1 + 9 = 10$$

$$2 + 8 = 10$$

$$3 + 7 = 10$$

$$4 + 6 = 10$$

$$5 + 5 = 10$$

$$6 + 4 = 10$$

$$7 + 3 = 10$$

$$8 + 2 = 10$$

$$9 + 1 = 10$$

$$b) 1075 + 199 + 25 + 1$$

$$= \underline{1075 + 25} + \underline{199 + 1}$$

$$= 1100 + 200$$

$$= 1300$$

$$(c) 1238 + 2755 + 762 + 3245$$

$$= \underline{1238 + 762} + \underline{2755 + 3245}$$

$$= 2000 + 5000$$

$$= 7000$$

Que-3 Fill in the blanks

$$(a) 1354 + 646 = 646 + 1354 \text{ (commutative property)}$$

$$(b) 5151 + 2079 = 2079 + 5151 \text{ (commutative property)}$$

$$(c) 7425 + (529 + 471) = (7425 + 529) + 471 \text{ (Associativity)}$$

$$(d) 9012 + (888 + 505) = (9012 + 888) + 505 \text{ (Associativity)}$$

Q.4 Perform subtraction and verify by addition.

P.T.O

Subtract

$$\begin{array}{r} 0999910 \\ 1000000 \\ - 55029 \\ \hline 044971 \end{array}$$

Verify

$$\begin{array}{r} 44971 \\ + 55029 \\ \hline 100000 \end{array}$$

b) Subtract

$$\begin{array}{r} 11012141310 \\ 218540 \\ - 34649 \\ \hline 178891 \end{array}$$

Verify

$$\begin{array}{r} 00000 \\ 178891 \\ + 34649 \\ \hline 213540 \end{array}$$

c) Subtract

$$\begin{array}{r} 091091010 \\ 1000000 \\ - 099999 \\ \hline 01011 \end{array}$$

Verify

$$\begin{array}{r} 00000 \\ 99999 \\ + 1011 \\ \hline 101010 \end{array}$$

Ex 2.1

u5 Fill in the blanks.

$$\begin{array}{r} 3910910913 \\ 4000000 \\ - \boxed{8}\boxed{7}\boxed{5}\boxed{8}\boxed{7}\boxed{6} \\ \hline 31\boxed{3}\boxed{4}\boxed{2}\boxed{2}\boxed{7} \end{array}$$

$$\begin{array}{r} 09910910 \\ 1000000 \\ - \boxed{2}\boxed{9}\boxed{7}\boxed{7}\boxed{1} \\ \hline 7032\boxed{9} \end{array}$$

u6) Marked price of sofa set = Rs 5620
Discount given = Rs 500
Profit of shopkeeper = (-) 5120
Cost price of sofa set = 4000

Ans → CP of sofa set is Rs 4000.

7) Total money Pooja has = Rs 550
Cost of shoes = Rs 125
Cost of saree = Rs 250
Cost of tea set = Rs 175
Total money spent = Rs 550

Money left = Total money - Money spent
= Rs 550 - Rs 550
= 0

Ans Pooja is left with no money

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Properties of Multiplication

1. Closure property :- The product of two whole numbers is also a whole number.
i.e. $a \times b = c$ (where a, b, c are whole nos)

e.g. $2 \times 3 = 6$

2. Commutative property :- Two whole numbers can be multiplied in any order. i.e. $a \times b = b \times a$

e.g. $2 \times 3 = 3 \times 2$
 $6 = 6$

3. Associative property :- Three whole nos can be grouped in any order and multiplied.

e.g. $a \times (b \times c) = (a \times b) \times c$

$$\begin{aligned} \Rightarrow 2 \times (3 \times 4) &= (2 \times 3) \times 4 \\ &= 2 \times 12 = 6 \times 4 \\ &= 24 = 24 \end{aligned}$$

Properties of Division

1. Division does not satisfy closure property.

i.e. $a \div b$ is not a whole no always

$$2 \div 4 = \frac{1}{2} \text{ is not a whole } \underline{\text{no}}$$

2. Division of whole nos is not commutative

$$\begin{aligned} \Rightarrow \text{i.e. } a \div b &\neq b \div a \\ 4 \div 2 &\neq 2 \div 4 \\ 2 &\neq \frac{1}{2} \end{aligned}$$

3. Division is not associative

* Euclid's Division Algorithm
Example $\rightarrow 16 \div 5$

$$\begin{array}{r} 5 \overline{) 16} \\ \underline{- 15} \\ 1 \end{array}$$

$(3 \rightarrow \text{Quotient } (q))$
 $\rightarrow \text{Dividend } (D)$
 $\rightarrow \text{Remainder } (R)$
 $\rightarrow \text{Divisor } (d)$

$$\text{Dividend} = (\text{divisor} \times \text{quotient}) + \text{Remainder}$$

$$D = (d \times q) + R$$

$$D = (d \times q) + R$$

$$16 = (5 \times 3) + 1$$

$$16 = 15 + 1$$

$$16 = 16$$

Hence verified.

EX 2.2 (Pg. 19)

Que-1 State the properties used:

1. $12 \times 3 = 3 \times 12 \rightarrow$ Commutative

2. $12 \div 3 \neq 3 \div 12 \rightarrow$ Division is not commutative

3. $12 \times 15 = 180 \rightarrow$ Multiplication is closed.

4. $12 \div 3 = 4 \rightarrow$ Division is sometimes closed

5. $2 \div 8 = \frac{1}{4}$ Division is not closed

6. $(9 \times 3) \times 2 = 9 \times (3 \times 2)$ Multiplication is Associative

7. $(12 \div 3) \div 2 \neq 12 \div (3 \div 2)$ Division is not associative.

Que-2 Simplify by using properties.

(a) $25 \times 7 \times 4$
 $= 25 \times 4 \times 7$
 $= 100 \times 7$
 $= 700$

(b) $75 \times 5 \times 2 \times 20$
 $= 75 \times 2 \times 20 \times 5$
 $= 150 \times 100$
 $= 15000$

(c) $1234 \times 15 \times 2$
 $= 1234 \times 30$
 $= 37020$

Que-3 Find missing no

a) $32 \times \square = 128$

$\square = 128 \div 32$

$= 4$

$$\begin{array}{r} 32 \overline{) 128} \\ \underline{+ 28} \\ 0 \end{array}$$

b) $8 \times \square = 1096$

$\square = 1096 \div 8 = 137$

~~$$\begin{array}{r} 212 \\ 8 \overline{) 1096} \\ \underline{- 8} \\ 29 \\ \underline{- 8} \\ 21 \\ \underline{- 8} \\ 13 \\ \underline{- 8} \\ 5 \\ \underline{- 5} \\ 0 \end{array}$$~~

~~$$\begin{array}{r} 137 \\ 8 \overline{) 1096} \\ \underline{- 8} \\ 29 \\ \underline{- 24} \\ 56 \\ \underline{- 56} \\ 0 \end{array}$$~~

Que-4 Divide by repeated subtraction.

a) $64 \div 8 = \boxed{8}$

$64 - 8 = 56 \rightarrow 1$

$56 - 8 = 48 \rightarrow 2$

$48 - 8 = 40 \rightarrow 3$

$40 - 8 = 32 \rightarrow 4$

$32 - 8 = 24 \rightarrow 5$

$24 - 8 = 16 \rightarrow 6$

$16 - 8 = 8 \rightarrow 7$

$8 - 8 = 0 \rightarrow 8$

$$b) 112 \div 16 = \boxed{7}$$

$$112 - 16 = 96 \rightarrow 1$$

$$96 - 16 = 80 \rightarrow 2$$

$$80 - 16 = 64 \rightarrow 3$$

$$64 - 16 = 48 \rightarrow 4$$

$$48 - 16 = 32 \rightarrow 5$$

$$32 - 16 = 16 \rightarrow 6$$

$$16 - 16 = 0 \rightarrow 7$$

$$0 - 16 = -16 \rightarrow 8$$

1.6.19

Que-4 Divide by repeated subtraction

$$c) 100 \div 25$$

$$100 - 25 = 75 \text{ ①}$$

$$75 - 25 = 50 \text{ ②}$$

$$50 - 25 = 25 \text{ ③}$$

$$25 - 25 = 0 \text{ ④}$$

$$100 \div 25 = 4$$

$$d) 625 \div 25$$

$$625 - 25 = 600 \text{ ①} \quad 525 - 25 = 500 \text{ ⑤}$$

$$600 - 25 = 575 \text{ ②} \quad 500 - 25 = 475 \text{ ⑥}$$

$$575 - 25 = 550 \text{ ③} \quad 475 - 25 = 450 \text{ ⑦}$$

$$550 - 25 = 525 \text{ ④} \quad 450 - 25 = 425 \text{ ⑧}$$

$$\begin{aligned}
425 - 25 &= 400 \\
400 - 25 &= 375 \\
375 - 25 &= 350 \\
350 - 25 &= 325 \\
325 - 25 &= 300 \\
300 - 25 &= 275 \\
275 - 25 &= 250 \\
250 - 25 &= 225 \\
225 - 25 &= 200 \\
200 - 25 &= 175 \\
175 - 25 &= 150 \\
150 - 25 &= 125 \\
125 - 25 &= 100 \\
100 - 25 &= 75 \\
75 - 25 &= 50 \\
50 - 25 &= 25 \\
25 - 25 &= 0 \\
625 \div 25 &= 25
\end{aligned}$$

Que - 5 Divide by Division Algorithm and verify by multiplication MHW in CW (B) 5th, h

c) $13472 \div 65$

207 $\rightarrow$ quotient (Q)

$\sqrt{65} \overline{) 13472} \rightarrow$ dividend (D)

Divisor (d) - 130 $\downarrow$

0047 $\downarrow$

- 0 $\downarrow$

472

- 455

017 $\rightarrow$ Remainder (R)

$$65 \times 1 = 65$$

$$65 \times 2 = 130$$

$$65 \times 3 = 195$$

$$65 \times 4 = 260$$

$$65 \times 5 = 325$$

$$65 \times 6 = 390$$

$$65 \times 7 = 455$$

$$65 \times 8 = 520$$

$$65 \times 9 = 585$$

$$65 \times 10 = 650$$

Verification: Euclid's division Algorithm

Dividend = (divisor $\times$ quotient) + Remainder

$$D = (d \times q) + R$$

$$13472 = (65 \times 207) + 17$$

$$\begin{array}{r} 207 \\ \times 65 \\ \hline 1035 \\ 1242 \times \\ \hline 13455 \\ + 17 \\ \hline 13472 \end{array}$$

13472

Hence verified

f) $75293 \div 195$

$$\begin{array}{r} 386 \rightarrow q \\ 195 \overline{) 75293} \rightarrow D \\ \underline{d \downarrow - 585 \downarrow} \\ 1679 \\ \underline{- 1560} \\ 1193 \\ \underline{- 1170} \\ 0023 \rightarrow R \end{array}$$

$$(F) \quad 79575293 \div 195$$

386 → Quotient (q)

195 | 79575293 → Dividend (D)

↓ -585 ↓

Divisor (d) 1679

-1560 ↓

01193

1170

00023 → Remainder (R)

$$195 \times 01 = 195$$

$$195 \times 02 = 390$$

$$195 \times 03 = 585$$

$$195 \times 04 = 780$$

$$195 \times 05 = 975$$

$$195 \times 06 = 1170$$

$$195 \times 07 = 1365$$

$$195 \times 08 = 1560$$

$$195 \times 09 = 1755$$

$$195 \times 10 = 1950$$

Verification:

$$D = (d \times q) + R$$

$$75293 = (195 \times 386) + 13$$

$$\begin{array}{r} 195 \\ \times 386 \\ \hline 1170 \\ 7800 \\ 39000 \\ \hline 75293 \end{array}$$

$$75293 = 75293$$

Hence verified

(i) $90078 \div 89$

$$\begin{array}{r} 1012 \rightarrow \text{quotient (q)} \\ 89 \overline{) 90078} \rightarrow \text{dividend (D)} \\ \underline{-89} \\ 010 \\ \underline{-0} \\ 0107 \\ \underline{-89} \\ 188 \\ \underline{-178} \\ 010 \rightarrow \text{Remainder (R)} \end{array}$$

$$\begin{array}{l} 89 \times 1 = 89 \\ 89 \times 2 = 178 \\ 89 \times 3 = 267 \\ 89 \times 4 = 356 \\ 89 \times 5 = 445 \\ 89 \times 6 = 534 \\ 89 \times 7 = 623 \\ 89 \times 8 = 712 \\ 89 \times 9 = 801 \\ 89 \times 10 = 890 \end{array}$$

Verification:

$$D = (d \times q) + R$$
$$90078 \neq (89 \times 1012) + 10$$

$$\begin{array}{r} 1 \\ 11 \\ 1012 \\ \times 89 \\ \hline 09108 \\ + 80076 \\ \hline 810068 \\ + 10 \\ \hline 90078 \end{array}$$

$90078 = 90078$
Hence Verified

~~8~~ ~~8~~ ~~5~~ ~~26~~

Fill ups

- a) $505 \times 983 = 983 \times \underline{505} \rightarrow$ Commutative
- b) $\underline{197} \times 789 = 789 \times 197 \rightarrow$ Commutative
- c) $39 \times (5037 \times 13) = (\underline{39} \times 5037) \times 13$
 $\rightarrow$ Associative property
- d) $(297 \times 426) \times 99 = 297 \times (426 \times 99)$
 $\rightarrow$ Associative property.

H. W.

Que-5 (b) $9735 \div 199$

48 $\rightarrow$ quotient (q)

199 $\overline{) 9735} \rightarrow$ dividend (d)

$\downarrow = 796 \downarrow$

divisor (d) 199

$- 1592$

0183 $\rightarrow$ Remainder (R)

$$199 \times 1 = 199$$

$$199 \times 2 = 398$$

$$199 \times 3 = 597$$

$$199 \times 4 = 796$$

$$199 \times 5 = 995$$

$$199 \times 6 = 1194$$

$$199 \times 7 = 1393$$

$$199 \times 8 = 1592$$

$$199 \times 9 = 1791$$

$$199 \times 10 = 1990$$

Verification:

$$D = (d \times q) + R$$

$$9735 = (199 \times 48) + 183$$

$$\begin{array}{r} 48 \\ \times 199 \\ \hline \end{array}$$

$$199$$

$$\times 48$$

$$199 \times 8 = 1592$$

$$199 \times 40 = 7960$$

$$199 \times 50 = 9950$$

$$183$$

$$= 9735$$

$$9735 = 9735$$

Hence verified.

$$(e) 57851 \div 208$$

$$\begin{array}{r} 278 \rightarrow (q) \\ 208 \overline{) 57851} \rightarrow (D) \\ \underline{-416} \\ 16285 \\ \underline{-1456} \\ 01698 \times 10 \\ \underline{-1664} \\ 00234 \rightarrow (R) \end{array}$$

$$208 \times 1 = 208$$

$$208 \times 2 = 416$$

$$208 \times 3 = 624$$

$$208 \times 4 = 832$$

$$208 \times 5 = 1040$$

$$208 \times 6 = 1248$$

$$208 \times 7 = 1456$$

$$208 \times 8 = 1664$$

$$208 \times 9 = 1872$$

$$208 \times 10 = 2080$$

Verification:

$$D = (d \times q) + R$$

$$57851 = (208 \times 278) + 234$$

$$\begin{array}{r} 278 \\ \times 208 \\ \hline 2224 \\ 0000 \\ 5560 \\ \hline 57851 \\ + 234 \\ \hline = 57851 \end{array}$$

$$57851 = 57851$$

Hence verified.

$$(h) 37678 \div 402$$

$$\begin{array}{r} 93 \\ 402 \overline{) 37678} \\ \underline{-3618} \downarrow \\ 01498 \\ \underline{-1206} \\ 0292 \end{array}$$

$$402 \times 1 = 402$$

$$402 \times 2 = 804$$

$$402 \times 3 = 1206$$

$$402 \times 4 = 1608$$

$$402 \times 5 = 2010$$

$$402 \times 6 = 2412$$

$$402 \times 7 = 2814$$

$$402 \times 8 = 3216$$

$$402 \times 9 = 3618$$

$$402 \times 10 = 4020$$

Verification:

Dividend = (divisor $\times$ quotient) +
Remainder

$$D = (d \times q) + R$$

$$37678 = (402 \times 93) + 292$$

$$\begin{array}{r} 402 \\ \times 93 \\ \hline 1206 \\ 3618 \times \\ \hline 37386 \\ + 292 \\ \hline 37678 \end{array}$$

Hence verified

Ex 2.2

7) Write True or False

(a) $1000 \times 25 = 25 \times 1000 \rightarrow$ True $\rightarrow M$ is commutative

(b) $1000 \div 25 = 25 \div 1000 \rightarrow$ False $\rightarrow D$ is not commutative.

(c) $(1000 \times 25) \times 5 = 1000 \times (25 \times 5) \rightarrow$ True $\rightarrow M$ is Associative

(d) $(1000 \div 25) \div 5 = 1000 \div (25 \div 5) \rightarrow$ False $\rightarrow D$ is not Associative

Que-8 (a) $D = 35784$, $d = 15$ $q = \boxed{2385}$
 $R = \boxed{9}$

$$\begin{array}{r}
 2385 \\
 15 \overline{) 35784} \\
 \underline{- 30} \downarrow \\
 057 \downarrow \\
 \underline{- 45} \downarrow \\
 128 \downarrow \\
 \underline{- 120} \downarrow \\
 0084 \downarrow \\
 \underline{75} \\
 09
 \end{array}$$

8) b) $D = \boxed{}$ $d = 951$, $q = 1051$
 $R = 498$

$$D = (d \times q) + R$$

$$= (951 \times 1051) + 498$$

$$\begin{array}{r} \frac{5}{2} \\ 1051 \\ \times 951 \\ \hline 1051 \\ 5255 \\ 999501 \\ \hline 10999501 \\ + 498 \\ \hline 10999999 \rightarrow \text{Dividend} \end{array}$$

8) (c) $D = 46087$, $d = \boxed{}$, $q = 129$,
 $R = 163$

$$D = (d \times q) + R$$

$$46087 = (d \times 129) + 163$$

$$46087 - 163 = d \times 129$$

$$45924 \div 129 = d \quad 129 \overline{) 45924}$$

$$356 = d$$

$$\therefore \text{divisor} = 356$$

$$\begin{array}{r} 356 \\ 129 \overline{) 45924} \\ \underline{- 387} \\ 0722 \\ \underline{- 645} \\ 774 \\ \underline{- 774} \\ 0 \end{array}$$

a) Total students = 600

Student in one row = 24

No. of rows = $600 \div 24$

$$25 = \boxed{25}$$

$$24 \overline{) 600}$$

$$\underline{- 48} \downarrow$$

$$120$$

$$\underline{120}$$

$$0$$

Ans $\rightarrow$ There 25 rows.

1c) Total plants = 640

No of rows = 32

No of plants in 1 row = $640 \div 32$

$$20$$
$$32 \overline{) 640}$$

$$\underline{- 64} \downarrow$$

$$000$$

$$\underline{- 0}$$

$$000$$

Ans $\rightarrow$ 20 plants are there in
1 row

ii) Total money collected = Rs 4800
(1 Rs = 100p)
= Rs 48000 × 100
entry free for 1 person = Rs 7.50
= 750p

$$\begin{aligned}\text{No of persons saw} &= \frac{480000}{750} \\ &= \frac{48000}{75} \\ &= 640\end{aligned}$$

Ans → 640 persons saw the magic show

PROPERTIES OF 1 AND 0

★ Points

1. The product of any ^{number} and 1 is the number itself.

$$\text{ex} \rightarrow 1 \times a = a \times 1 = a$$

$$\text{ex} \rightarrow 1 \times 7 = 7 \times 1 = 7$$

2. The product of any number and 0 is 0. zero.

$$\text{ex} \rightarrow 0 \times a = a \times 0 = 0$$

$$0 \times 7 = 7 \times 0 = 0$$

3. The sum of a number and zero is the number itself.

$$\text{ex} \rightarrow 0 + a = a + 0 = a$$

$$0 + 7 = 7 + 0 = 7$$

4. Zero divided by a natural number is zero

$$\text{Ex} \rightarrow 0 \div a = 0$$

$$0 \div 7 = 0$$

5. Division by zero is not possible

$$\text{Ex} \rightarrow a \div 0 = \text{unknown}$$

$$7 \div 0 = \text{Not possible}$$

Exercise 2.3

1. Simplify each expression.

$$(a) 5 + 0 = 5 \quad (f) 0 \div 8 = 0$$

$$(b) 5 - 0 = 5 \quad (g) 8 \times 1 = 8$$

$$(c) 7 \times 0 = 0 \quad (h) 9 \div 1 = 9$$

$$(d) 9 \times 0 = 0$$

$$(e) \frac{0}{7} = 0$$

Q.2 Find 'n'

$$(a) 7 + n = 7$$

$$7 + \boxed{0} = 7$$

$$\therefore n = 0$$

$$(e) 11 \div n = 11$$

$$11 \div \boxed{1} = 11$$

$$\therefore n = 1$$

$$(b) a \times n = a$$

$$9 \times \boxed{1} = 9$$

$$\therefore n = 1$$

$$(f) h \div 8 = 0$$

$$\boxed{0} \div 8 = 0$$

$$\therefore n = 0$$

$$(c) 10 \times n = 0$$

$$10 \times \boxed{0} = 0$$

$$(d) 9 - n = 9$$

$$9 - \boxed{0} = 9$$

$$\therefore n = 0$$

Q.3 → we cannot divide zero by zero because division by zero is not possible.

Q.4 → (a) $7 \times 1 = 7$

(b) $18 + 0 = 18$

(c) $3276 + 0 = 3276$

(d) $1000 \div 0 = 0$

(e) $1000 \times 1 = 1000$

(f) $4798 - 4798 = 0$

(g) $826 \times (10 - 10)$

$= 826 \times 0$

$= 0$

(h) $(957 - 957) \times 7$

$= 0 \times 7$

$= 0$

(i) $(1000 - 1000)$

$+ 7$

$= 0 + 7$

$= 7$

Q.5 Find n

(a) $35 \times (3 - n) = 0$

$35 \times (3 - 3) = 0$

$35 \times 0 = 0$

$0 = 0$

∴ n is 3

(b) $25 \times (3 - n) = 25$

$25 \times (3 - 2) = 25$

$25 \times 1 = 25$

0×0

∴ n is 2

$$\begin{aligned} \text{(c)} \quad (18+2)+n &= 20 \\ 20 + [0] &= 20 \\ 20 &= 20 \\ \therefore n &= 0 \end{aligned}$$

$$\begin{aligned} \text{(d)} \quad (18+n)-0 &= 18 \\ (18+[0])-0 &= 18 \\ 18-0 &= 18 \\ 18 &= 18 \\ \therefore n &= 0 \end{aligned}$$

$$\begin{aligned} \text{(e)} \quad (3 \times 4) \times n &= 12 \\ 12 \times [1] &= 12 \\ 12 &= 12 \\ \therefore n &= 1 \end{aligned}$$

$$\begin{aligned} \text{(f)} \quad (7 \times 9) \times n &= 0 \\ 63 \times [0] &= 0 \\ 0 &= 0 \\ \therefore n &= 0 \end{aligned}$$

$$\begin{aligned} \text{(g)} \quad 8 \times 3 \times n &= 24 \\ 24 \times [1] &= 24 \\ \therefore n &= 1 \end{aligned}$$

$$\begin{aligned} \text{(h)} \quad 3 \times 7 \times 9 \times 2 \times 0 &= n \\ 0 &= n \\ \therefore n &= 0 \end{aligned}$$

$$\begin{aligned} \text{(i)} \quad n \times (8-7) &= n \\ [] \times [] & \\ 0 \times 1 &= [0] \quad 2 \times 1 = [2] \\ 1 \times 1 &= [1] \quad 3 \times 1 = [3] \\ \therefore n &= 0, 1, 2, 3, 4, \dots \\ n &\text{ is any whole no.} \end{aligned}$$

$$\begin{aligned}
 (j) \quad (3 \times 4 \times n) + n &= 12n \\
 12 \times [0] + [0] &= 12[0] \\
 0 + 0 &= 0 \\
 0 &= 0 \\
 n &= 0
 \end{aligned}$$

$$\begin{aligned}
 (k) \quad (9-2) - n &= 0 \\
 7 - [7] &= 0 \\
 0 &= 0 \\
 \therefore n &= 7
 \end{aligned}$$

Distributive Property
★ Points.

If a, b, c are whole nos. then
 $a \times (b+c) = (a \times b) + (a \times c)$
 $a \times (b-c) = (a \times b) - (a \times c)$

Ex-2.4

Q.1 Simplify in the easiest way:

$$a) (8 \times 96) + (8 \times 4)$$

$$\begin{aligned}
 &\Rightarrow (8 \times 96) + (8 \times 4) \\
 &= 8 \times (96 + 4) \\
 &= 8 \times 100 \\
 &= 800
 \end{aligned}$$

$$b) (9 \times 92) + (8 \times 9)$$

$$\begin{aligned}
 &\Rightarrow 9 \times (92 + 8) \\
 &= 9 \times 100 \\
 &= 900
 \end{aligned}$$

$$(a) (13 \times 107) - (7 \times 13)$$

$$13 \times (107 - 7)$$

$$13 \times 100$$

$$= 1300$$

2. Use distributive property to find:

$$(a) 1001 \times 87$$

$$(1000 + 1) \times 87$$

$$(1000 \times 87) + (87 \times 1)$$

$$= 87000 + 87$$

$$= 87087$$

$$b) 597 \times 1003$$

$$(1000 + 3) \times 597$$

$$(597000 + 1791)$$

$$= 598791$$

$$c) 996 \times 265$$

$$(1000 - 4) \times 265$$

$$265000 - 1060$$

$$= 264000 - 1060 = 263940$$

$$\begin{array}{r} 22 \\ 597 \\ \times 3 \\ \hline 1791 \end{array}$$

$$\begin{array}{r} 22 \\ 265 \\ \times 4 \\ \hline 1060 \end{array}$$

$$\begin{array}{r} 4910 \\ 265000 \\ - 1060 \\ \hline 263940 \end{array}$$

$$d) 266 \times 1098$$

$$(1100 - 2) \times 266$$

$$292600 + 532$$

$$= 292068$$

$$\begin{array}{r} 1100 \\ \times 266 \\ \hline 6600 \\ 6600 \times \\ 2200 \times \\ \hline 292600 \end{array}$$

Q.3 Find 'n'

$$a) n(3+2) = (4 \times 3) + (4 \times 2)$$

$$n \cancel{n} (3+2) = \boxed{4} (3+2)$$

$$n = 4$$

$$b) 8(7-1) = (n \times 7) - (n \times 1)$$

$$\boxed{8} (7-1) = \boxed{n} (7-1)$$

$$n = 8$$

$$\begin{array}{r} 266 \\ \times 2 \\ \hline 532 \end{array}$$

$$\begin{array}{r} 292600 \\ - 532 \\ \hline 292068 \end{array}$$

$$c) 3(n+2) = (3 \times 6) + (3 \times 2)$$

$$\boxed{3} (n+2) = \boxed{3} (\boxed{6} + 2)$$

$$n = 6$$

Distributed

$$d) 7(6-1) = (7 \times 6) - (7 \times n)$$

$$7(6-1) = (7 \times 6) - (7 \times \boxed{1})$$

$$e) n(8-1) = (2 \times 8) - (n \times 1)$$

$$\boxed{2} (8-1) = (2 \times 8) - (2 \times 1)$$

★ Points

1. The order in which different operations are carried out in simplifying expressions is done by ~~was~~ the word BODMAS.

B $\rightarrow$ Bracket $(-, (), \{ \}, [])$

O $\rightarrow$ Of (x)

D $\rightarrow$ Division $(\div)$

M $\rightarrow$ Multiplication $(\times)$

A $\rightarrow$ Addition $(+)$

S $\rightarrow$ Subtraction $(-)$

2. Different types of bracket are

- i) $-$ $\rightarrow$ Bar or vinculum
- ii) $()$ $\rightarrow$ Simple bracket
- iii) $\{ \}$ $\rightarrow$ Braces or curly bracket
- iv) $[]$ $\rightarrow$ Square or big bracket

Ex 2.5

1) Simplify

$$(a) \frac{(2 \times 4) + 6}{7} + [(16 \times 1) - 3]$$

$$= \frac{8 + 6}{7} + [16 - 3]$$

$$= \frac{8 + 6}{7} + 13$$

$$= \frac{14}{7} + 13$$

$$= 2 + 13$$

$$= 15$$

$$\begin{aligned}
 b) & [(18 \times 2) \div 4] + \frac{(3 \times 2) - 4}{2} \\
 & = [\underline{36} \div 4] + \frac{6 - 4}{2} \\
 & = 9 + \frac{2}{2} \\
 & = 9 + 1 \\
 & = 10
 \end{aligned}$$

$$\begin{aligned}
 c) & \left[\frac{3 \times 8}{2} + 3 \right] - \frac{5 + 1}{2} \\
 & = \left[\frac{24}{2} + 3 \right] - \frac{6}{2} \\
 & = [24 \div 2 + 3] - 3 \\
 & = [6 + 3] - 3 \\
 & = 9 - 3 \\
 & = 6
 \end{aligned}$$

$$d) \left[\left\{ \frac{16 \times 2}{2} + (2 \times 2) - 4 \right\} \right] \div 16$$

$$= \left[\left\{ \frac{16 \times 2}{2} + 4 - 4 \right\} \right] \div 16$$

$$= \left[\left\{ \frac{32}{2} + 4 - 4 \right\} \right] \div 16$$

$$= \left[\left\{ \frac{16 + 4 - 4}{1} \right\} \right] \div 16$$

$$= \left[\left\{ 20 - 4 \right\} \right] \div 16$$

$$[16] \div 16 = 1 \quad \text{Ans} = 1$$

H.W. in C.W (B)
e, f
Ex 2.6 Copy

H.W.

$$c) [(3+7) \div (0+5)] + \{2 \times 3 + 1\}$$

$$= [10 \div 5] + \{7\}$$

$$= 2 + 7$$

$$= 9$$

$$(f) [3 \times 2 + \{1 \times \frac{1}{2} \text{ of } 30 \div 5\}]$$

$$= [3 \times 2 + \{\frac{3}{2} \times 30 \div 5\}]$$

$$= [3 \times 2 + \{\frac{3}{2} \times 10\}]$$

$$[6 + \{15\}]$$

$$6 + 15 = \underline{21} \quad | \quad \underline{\text{Ans}} = \underline{21}$$

2. Write T or F

~~36~~

$$(a) (24 + 12) \div 2 = 24 \div 2 + (12 \div 2)$$

$$36 \div 2 = 24 \div 2 + 6$$

$$18 = 12 + 6$$

$$18 = 18$$

$$\text{LHS} = \text{RHS}$$

True

$$(b) 3 \times (7 \times 4) = (3 \times 7) \times 4$$

$$3 \times 28 = 21 \times 4$$

$$84 = 84$$

True Associative Property

$$(c) (20 \div 2) = 5 \times 2$$

$$10 = 10$$

True

3) Insert brackets

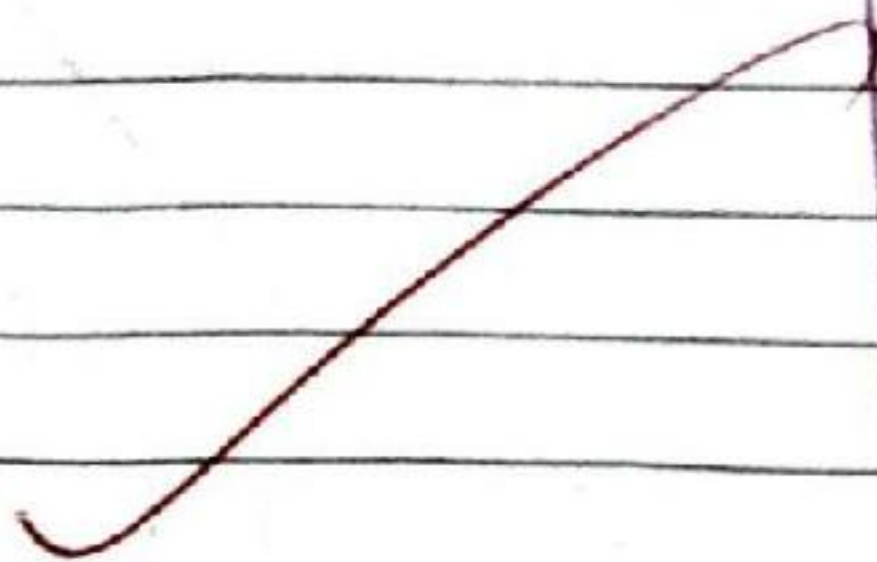
a) $20 + 20 \div 5 - 3 = 21$

$$\left[\{ 20 + (20 \div 5) \} - 3 \right] = 21$$

$$\left[\{ 20 + 4 \} - 3 \right] = 21$$

$$\left[24 - 3 \right] = 21$$

$$21 = 21$$



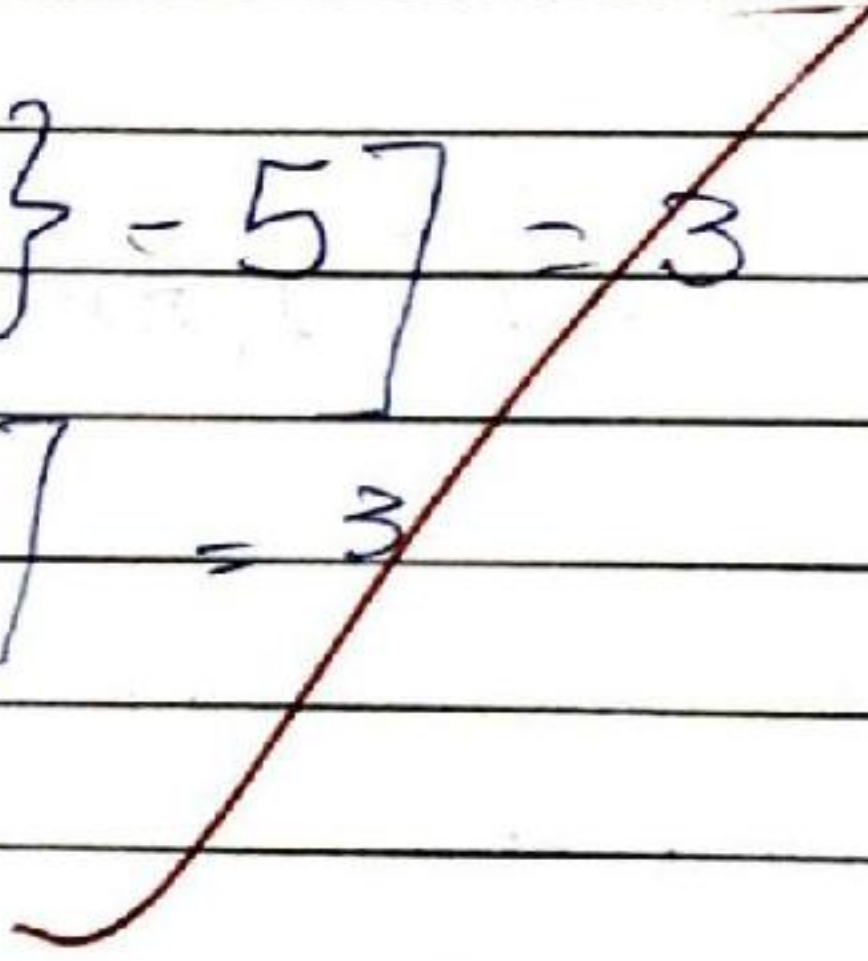
b) =

$$20 + 20 \div 5 - 5 = 3$$

$$\left[\{ (20 + 20) \div 5 \} - 5 \right] = 3$$

$$\left[\{ 40 \div 5 \} - 5 \right] = 3$$

$$\left[4 - 5 \right] = 3$$



Insert brackets

4) $10 + 12 \div 20 \div 5$ so that it is a whole no

$$\boxed{10 + \{12 \div (20 \div 5)\}}$$
$$= \boxed{10 + \{12 \div 4\}}$$

$$\boxed{10 + 3}$$

$$= 13$$

Yes 13 is a whole no

Q.5 Find n (n is a whole no)

(a) $3 + n = 3$

$$3 + \boxed{0} = 3$$

$$\therefore n = 0$$

(b) $n \div 3 = n$

$$\boxed{0} \div 3 = \boxed{0}$$

$$0 = 0$$

$$n = 0$$

(c) $3 \times n = n$

$$3 \times \boxed{0} = \boxed{0}$$

d) $3 \div h = n$

$$3 \div \boxed{0} = \boxed{13}$$

$$\begin{aligned}
 (e) \quad n \times n &= n \\
 [0] \times [0] &= [0] \\
 [1] \times [1] &= [1] \\
 \therefore n &= 0 \& 1
 \end{aligned}$$

$$\begin{aligned}
 (f) \quad 37 + (5 - n) &= 37 \\
 37 + (5 - [5]) &= 37 \\
 37 + 0 &= 37 \\
 37 &= 37 \\
 n &= 5
 \end{aligned}$$

$$\begin{aligned}
 (g) \quad (52 - [51]) \times 4 &= 4 \\
 52 - [5] &= 1 \times 4 = 4 \\
 n &= 51
 \end{aligned}$$

$$1) a * b = a + 2b$$

find

$$b) 6 * 7 \text{ and } 7 * 6$$

$$\text{In } 6 * 7, a = 6, b = 7$$

$$a * b = a + 2b$$

$$6 * 7 = 6 + 2 * 7$$

$$= 6 + 14$$

$$= 20$$

$$\text{In } 7 * 6, a = 7, b = 6$$

$$a * b = a + 2b$$

$$7 * 6 = 7 + 2 * 6$$

$$= 7 + 12$$

$$= 19$$

$$6 * 7 \neq 7 * 6$$

$$20 \neq 19$$

Hence the operation is not commutative.

$$Q. 7(c) a * b = a + 2b$$

$$\text{In } 12 * 5, a = 12, b = 5$$

$$12 * 5 = 12 + 2 * 5$$

$$= 12 + 10$$

$$= 22$$

$$\text{In } 5 * 12, a = 5, b = 12$$

$$5 * 12 = 5 + 2 * 12$$

$$= 5 + 24$$

$$= 29$$

$$12 * 5 \neq 5 * 12$$

$$22 \neq 29$$

$\therefore$ The above operation is not commutative.

q. 8 a) Simplify

$$3 [24 \div \{ (5-1) + 8 \}]$$

$$3 [24 \div \{ 4 + 8 \}]$$

$$= 3 [24 \div 12]$$

$$= 3 [2]$$

$$= 3 \times 2$$

$$= 6$$

$$(b) 12 + 14 \div 7 \times 4 \text{ of } (3+5)$$

$$= 12 + 14 \div 7 \times 4 \times (3+5)$$

$$= 12 + 14 \div 7 \times 4 \times 8$$

$$= 12 + 2 \times 4 \times 8$$

$$= 12 + 8 \times 8$$

$$= 12 + 64$$

$$= 76$$