Date:

① BoDMAS → substraction
↑ Bracket → division → Addition
↓ order ↓ multiplication

(i) $4(10+15\div5\times4-2+2)$
$4(10+3\times4-2+2)$
$4(10+12-2+2)$
~~$4(22-2+2)$~~ ~~$4(22-2+2)$~~
$4(24)$ $4(22)$
$=88$

$=4(22-2+2)$
$=4(24-2)$
$=4(22)$
$=88$

14
26
40

(ii) $14+26-27\div3\times2$
$14+26-9\times2$
$14+26-18$
$=40-18$
$=22$

16
×3
48

(iii) $3+2^4\times(15\div5)$
$3+16\times3$
$3+48$
51

( ) → ①
{ } → ②
[ ] → ③
round
curly
square

60 mgs in mpt

Date:

Exponents/power

A mathematical notation that represent number of time a base should be multiplied e.g

x^5 ← power
↳ base $= x \cdot x \cdot x \cdot x \cdot x$

$3^2 = 3 \times 3 = 9$

$2^4 = 2 \times 2 \times 2 \times 2 = 16$

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

Multiplication:-

same variables / bases

$x^3 \times x^2 = x^5$

when bases are same powers are added

$y^1 \times y^5 = y^6$

when bases are different

$x^2 \times y^3 = x^2 y^3$

② power raised to the power

$(2^2)^3$

$= 2^6$

$= 64$

$(a^b)^c$

$= a^{bc}$

$\frac{169}{\times 9}$
$\frac{}{14}$ 4

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Fraction form of power

$\frac{x^2}{y^3}$ ⟶ numerator ⟶ denomerator $= \frac{y^{-3}}{x^2}$

$= x^2 y^{-3}$

$\frac{x}{y} = \frac{y^{-1}}{x^{-1}}$

$\frac{x^{-2}}{y^{-3}} = \frac{y^3}{x^2}$

Zero Exponent:-

Any number/base raised power zero, the result will be 1

$2^0 = 1$

$100^0 = 1$

$(543268)^0 = 1$

$(x^2 y^3 z^6)^0 = 1$

$\sqrt{\ } = \frac{1}{n}$

$\sqrt[3]{\ } = \frac{1}{3}$

$\sqrt[4]{\ } = \frac{1}{4}$

Squall Root

$\sqrt{\ } = 1/2$

$\sqrt{4} = (4)^{1/2}$

$= (2^2)^{1/2}$

$= 2$

Date:

Additive inverse "0"

Changing the sign of the nomber and adding it to the orginall numbar

(i) 5, -5

$5-5=0$

(ii) $x^2, -x^2$

$x^2-x^2=0$

+x- = -
-x+ = -
-x- = +
+x+ = +

Multiplicative inverse : (1)

A numbar when multiply with the original number yields (1)

$5 \times \frac{1}{5} = 1$

$\frac{1}{x^2} \times x^2 = 1$

Number system :-

① Natural number :-

counting number staarting From 1 upto infinity are called natural numbers it is denoted by "N"

$N = \{1, 2, 3 \ldots \infty$

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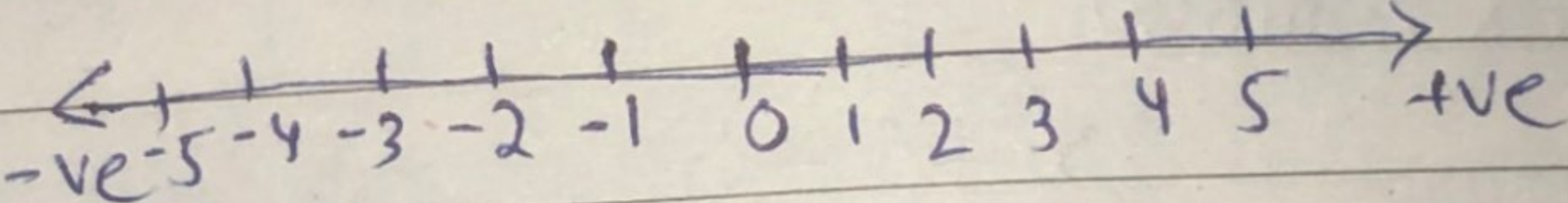
② Whole numbers:-
counting number starting from 0 upto infinity are called whole number it is denoted by W

$W = \{0, 1, 2, 3 \cdots\}$

③ integers:-
Natural number and their Additive inverse. It has no fraction or decimal form it is denoted by "Z"



natural number and its additive inverse called integers

④ Rational numbers:-
Number that can be written in the form of $\frac{P}{q}$ are called rational numbers. It is denoted by "Q"

$\frac{7}{4}, \frac{3}{2}, \frac{8}{5}$ → 3.2, $4.628531\cdots$

terminating form = Jahan number end ho after 4 or 5 digit.

non-terminating / recuring = $1.\bar{3}333\cdots$
$= 1.\bar{2}4\bar{2}4\bar{2}4\cdots$
= if specific number repeat

$\pi = \frac{22}{7} = \frac{P}{q}$ → rational number

$\frac{22}{7} = 3.142857$ → non-terminating and non recuring called irrational number. we can't write in P/q form

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non terminating and recuring number called rational number.

(5) Real number:

it is the combination of derived, rational, irrational, natural, whole number

3, 0, 1/2, -1/4, 3.2 ...

(6) complex number

$x^2+1=0$

$x^2=-1$

$\sqrt{x^2}=\sqrt{-1}$

$x=\sqrt{-1}=i \Rightarrow$ iota

$i=\sqrt{-1}$

$i^2=-1$

it is the combination of real and imaginary number called complex number. it denoted by Z

$Z=a+bi$ (a: real, bi: imaginary)

$2+3i$ (2 → R, 3i → I)

(i) $2+3i+2+4i$
$=4+7i$

(ii) $2+3i+4+3i$
$=6+6i$

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(7) Even number:

Number that all divisable by 2 all called even number

$E = \{2, 4, 6, 8, 10, 12 \cdots\}$

● zeee is also even number

i.e $\frac{0}{2} = 0$

(8) odd number:

Number that all not divisable by 2 all called odd number

$O = \{1, 3, 5, 7, 9, 11 \cdots\}$

(9) prime number:

Number that all divisable by 1 and itself all called prime number

2, 3, 5, 7, 11

composite number all that which is not prime number and 1 is not prime number, zeee is neither prime or non composite.

4 → 1, 2, 4

↓

its not prime its composite number

Arithmatic of decimal numbers:-

① Addition of decimal numbee

$12.5 + 6.23 = 18.73$

$14.7 + 3.685 = 18.385$

$13.64 + 5.431 + 3.82 = 22.891$

$$\begin{array}{r} 12.5 \\ 6.23 \\ \hline 18.73 \end{array}$$

$$\begin{array}{r} 14.7 \\ 3.685 \\ \hline 18.385 \end{array}$$

$$\begin{array}{r} 13.64 \\ 5.431 \\ 3.82 \\ \hline 22.891 \end{array}$$

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② substraction of decimal number

(i) $8.5 - 6.23 = 2.27$

$$\begin{array}{r} 8.5^{1}0^{10} \\ -\ 6.23 \\ \hline 2.27 \end{array}$$

(ii) $7.5 - 4.368$

$$\begin{array}{r} 7.5^{1}0^{10} \\ -\ 4.368 \\ \hline 3.132 \end{array}$$

(iii) $5.3 - 2.8$

$$\begin{array}{r} 5.13 \\ -\ 2.8 \\ \hline 2.5 \end{array}$$

(i) substracting whole number from decimals

$$\begin{array}{r} 8.3 - 5 \\ 8.3 \\ -\ 5.0 \\ \hline 3.3 \end{array}$$

(ii) substracting decimal from whole number

(i) $9 - 4.2$

$$\begin{array}{r} 9.0 \\ -\ 4.2 \\ \hline 4.8 \end{array}$$

(ii) $9.6 - 4.17$

$$\begin{array}{r} 9.6^{1}0 \\ -\ 4.17 \\ \hline 5.43 \end{array}$$

3|613
2|21
1

Date:

(iii) Decimal multiplication

(i) 6.4×3.1

6.4

3.1

$6\ 4$

$19\ 2\ x$

$19.8\ 4$

(ii) 11.3×2.5

11.3

$\times 2.5$

$56\ 5$

$226\ x$

$28.2\ 5$

76

0.9

8.7

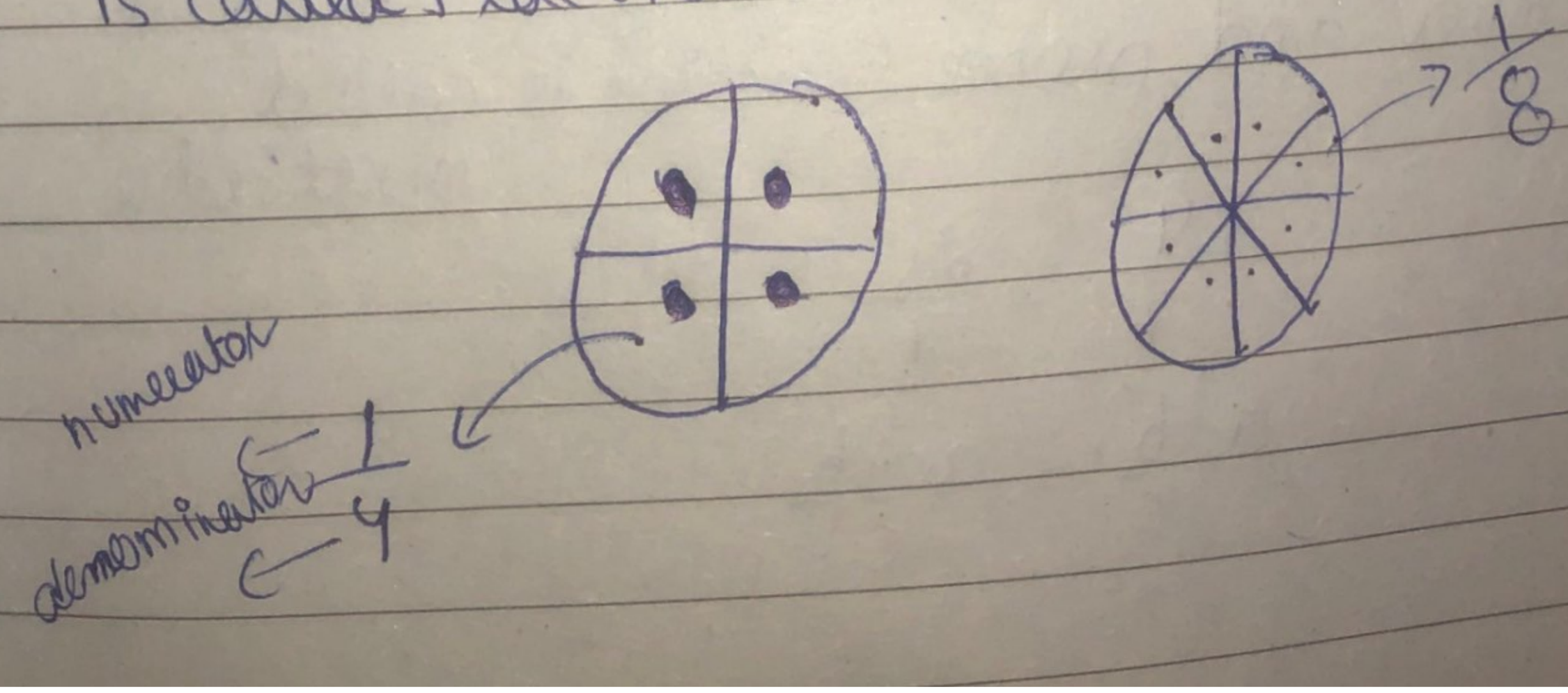
$6\ 3$

$7\ 2\ x$

$7.8\ 3$

Fraction:-

A small or tiny portion of something is called fraction.



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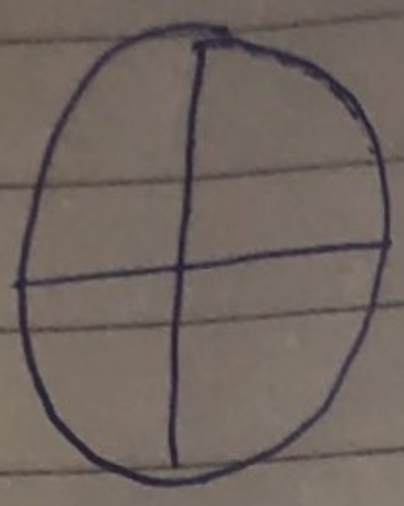
$\frac{2}{3}$ → i.e $\frac{2}{3}$ of majority



$\frac{3}{4}$

Types of fraction

① proper fraction: A fraction in which numerator is less than the denominator

$\frac{4}{5}, \frac{3}{7}, \frac{x^2}{x3}$

② improper fraction:

A fraction in which numerator is either equal or greater than the denominator.

$\frac{8}{5}, \frac{3}{2}$

③ mixed fraction :-

A combination of natural number and proper fraction is called mixed fration

$3\frac{4}{7} = \frac{25}{7}$

$\frac{a\,b}{c} = \frac{ac+b}{c}$

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1
70
18
15
103

Arithmatics of fractions:-

① Addition of fraction

$$\frac{1}{16}+\frac{3}{16}+\frac{5}{16}=\frac{1+3+5}{16}=\frac{9}{16}$$

$$\frac{1}{2}+\frac{3}{5}+\frac{7}{3}=\frac{15+18+70}{30}=\frac{103}{30}$$

② Substraction of fraction

$$\frac{2}{3}-\frac{1}{3}=\frac{2-1}{3}=1/3$$

$$\frac{1}{2}-\frac{3}{7}=\frac{7-6}{14}=\frac{1}{14}$$

③ Multiplication of Fraction

$$\frac{5}{3}\times\frac{2}{4}=\frac{10}{12}\,5=\frac{5}{6}$$

④ Divison of fraction

$$\frac{1}{6}\div\frac{1}{3}$$

$$=\frac{1}{\cancel{6}_2}\times\cancel{3}\,1$$

$$=\frac{1}{2}$$

428
×15
2140
420×
4200

LCM & HCF

LCM → least common multiple

HCF → highest common factor

2	28
2	14
7	7
	1

2	70
5	35
7	7
	1

2	84
2	42
3	21
7	7
	1

28 = 2×2×7
70 = 2×5×7
= 2×2×3×7

HCF = 2×7 = 14
LCM = 2×2×7×5×3
= 420

find the LCF & HCF 24 & 36

2	24
2	12
2	6
3	3
	1

2	36
2	18
3	9
3	3
	1

24 = 2×2×2×3
36 = 2×2×3×3

24
×3
72

HCF = 2×2×3 = 12
LCM = 2×2×3×2×3
= 72

Date:

Find the greatest number that divides 204 & 64 without a reminder

2	204
2	102
3	51
17	17
	1

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

$204 = 2 \times 2 \times 3 \times 17$

$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$HCF = 2 \times 2 = 4$

$LCF = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 17 =$

Division of decimal number

$8.5 \div 3.4 = 2.5$

2.5

$34 \overline{)85}$

68

170

170

$\times\times$

$10.8 \div 1.5$

7.2

$15 \overline{)108}$

105

$\times 30$

30

$\times\times$

$34 \times 2 = 68$

$34 \times 5 = 170$