# MATH DELIGHT 6 

Foundations of Upper Primary Mathematics


## Universal Active Mathematics

# Math Delight 

Foundations of Upper Primary Mathematics


Conceived and Written by
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# Universal Active Math - Math Delight VI - Foundations of Upper Primary Mathematics 

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Navnirmiti Trust Mumbai

How many rupees? Write the numbers in the houses.


How many rupees? Write the numbers in the houses.


How many rupees? Write the numbers in the houses.


How many rupees? Write the number.
Write the name of the number in words.


| Th | $H$ | $T$ | $U$ |
| :--- | :--- | :--- | :--- |
|  |  |  |  |



| Th | $H$ | $T$ | $U$ |
| :--- | :--- | :--- | :--- |
|  |  |  |  |
|  |  |  |  |

Write the numbers in sequence


Write the numbers.

| 10000 <br> rupee notes <br> $\mathbf{1 0 0 0 0}$ | $\begin{gathered} 1000 \\ \text { rupee notes } \\ \text { 1000 } \end{gathered}$ | $\begin{gathered} 100 \\ \text { rupee notes } \\ \text { 100 } \end{gathered}$ | 10 rupee notes | 1 rupee coins | Number |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 6 | 2 | 3 | 5 | 16,235 |
|  | 5 | 3 | 2 | 4 |  |
| 2 | 0 | 3 | 4 | 5 |  |
| 2 | 0 | 2 | 0 | 2 |  |
| 4 | 0 | 0 | 0 | 5 |  |
|  | 9 | 0 | 9 | 0 |  |
|  |  | 8 | 6 | 3 |  |
|  | 8 | 8 | 8 | 8 |  |
| 9 | 9 | 9 | 9 | 9 |  |
| 9 | 0 | 0 | 0 | 0 |  |
|  | 9 | 0 | 0 | 0 |  |
| 5 | 3 | 4 | 2 | 1 |  |

Observe the number and write how many notes of 10000, 1000, 100, 10 and 1 rupee will be needed to make that number.

| Number | 10000 rupee notes <br> 10000 | 1000 rupee notes | 100 rupee notes <br> 100 | $10$ <br> rupee notes <br> 10 $\square$ | $1$ <br> rupee coins |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 52,668 | 5 | 2 | 6 | 6 | 8 |
| 24,306 |  |  |  |  |  |
| 40,800 |  |  |  |  |  |
| 6,300 |  |  |  |  |  |
| 98,005 |  |  |  |  |  |
| 90,000 |  |  |  |  |  |
| 5,000 |  |  |  |  |  |
| 45,636 |  |  |  |  |  |
| 80,808 |  |  |  |  |  |
| 8,080 |  |  |  |  |  |
| 88,888 |  |  |  |  |  |

Write the names of houses for each number and read the number.

| Tens | Units |
| :---: | :---: |
| 3 | 7 |


|  |  | Units |
| :---: | :---: | :---: |
| 2 | 3 | 6 |


|  |  | Units |
| :---: | :---: | :---: |
| 5 | 0 | 5 |


|  |  |  | Units |
| :---: | :---: | :---: | :---: |
| 4 | 3 | 6 | 8 |$\quad$|  |  |  | Units |
| :---: | :---: | :---: | :---: |
| 5 | 0 | 0 | 2 |


|  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: |
| 4 | 1 | 3 | 6 | 8 |


|  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: |
| 5 | 0 | 3 | 0 | 9 |


|  |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3 | 5 | 1 | 0 | 7 | 2 | 5 |


|  |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4 | 0 | 4 | 0 | 0 | 0 | 4 |


|  |  |  |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 6 | 2 | 3 | 4 | 5 | 1 | 7 | 2 | 5 |


|  |  |  |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |


|  |  |  |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Put commas at the appropriate place in the given number, write its digits in appropriate houses and write the number.

| Tcr | Cr | TL | L | Tth | Th | H | T | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3 | 5 | 2 | 4 | 8 | 6 | 7 | 9 | 1 |

35 crore, 24 lakh, 86 thousand, 7 hundred and 91

247058

| Tcr | Cr | TL | L | Tth | Th | H | T | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |

$\qquad$

| Tcr | Cr | TL | L | Tth | Th | H | T | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |

$\qquad$

| Tcr | Cr | TL | L | Tth | Th | H | T | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |

$\qquad$

30000880 | Tcr | Cr | TL | L | Tth | Th | H | T | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

$\qquad$

| Tcr | Cr | TL | L | Tth | Th | H | T | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |

$\qquad$
Read the following numbers. Put commas at the appropriate place. Write the number in words.$45 \longrightarrow$
$\qquad$

$$
345 \longrightarrow
$$

$\qquad$

$$
1345 \longrightarrow
$$

$\qquad$

$$
21345 \longrightarrow
$$

$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
6004005
$\qquad$$10560009 \longrightarrow$
$\qquad$
$\qquad$
$\qquad$

## Smallest and Greatest Number.

Use the given digits without repetition and make the greatest and smallest 4 digit numbers.
Smallest


Greatest

| 9 | 7 | 2 | 1 |
| :--- | :--- | :--- | :--- |

a) $2,9,1,7$
b) $8,2,4,6$

c) $5,8,7,0$

d) $1,9,4,8$

e) $2,5,4,3$
f) $6,0,2,5$


Make the greatest and smallest 4 digit numbers by using only one digit twice.
Greatest

b) $9,5,1$
c) $3,4,0$
d) $8,3,6$
e) $5,9,0$
f) $8,7,1$


Make the greatest and the smallest 4 - digit numbers using any 4 digits with conditions as given. (You may use any 4 different digits from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
a) Digit 5 is always at tens place.


For TH, H and U position, choose digits from largest to smallest

| 9 | 8 | 5 | 7 |
| :--- | :--- | :--- | :--- |

Smallest

|  |  | 5 |  |
| :--- | :--- | :--- | :--- |

For TH, H and U position, choose digits
from smallest to largest.
But you can't take 0 in Th place

| 1 | 0 | 5 | 2 |
| :--- | :--- | :--- | :--- |

b) Digit 9 at units place.

Greatest


Smallest

c) Digit 1 at hundred's place.

Greatest


Smallest

d) Digit 4 at thousands place.

Greatest


Smallest

e) Digit 0 at units place.

Greatest


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Find the greatest and smallest numbers in each row.
a) $4327,389,280,1265$

Greatest

| 4 | 3 | 2 | 7 |
| :--- | :--- | :--- | :--- |

b) $1240,3999,1786,2028$

Greatest

c) $89725,29777,37890,22999$

Greatest

d) $34286,8764,34478,987$

Greatest

e) $10200,2010,50000,10002$


Smallest


## Ascending and Descending Order

1. Write the numbers in each row in ascending form.
a) 2202, 2002, 2022, 2220

Ascending form :
2002, 2022, 2202, 2220
b) $476902,4798,49280,3427$

Ascending form :
c) $94325,27450,86432,29876$

Ascending form :
d) $123456,654321,23456,65432$

Ascending form :
e) 20000, 2000, 200, 20

Ascending form :
$\square$
2. Write the numbers in each row in descending form.
a) $39287,4784,2902,3920$

Descending form :

39287, 4784, 3920, 2902
b) $7842,29762,47977,9999$

Descending form :
c) $10234,12034,12304,12340$

Descending form :
$\square$
d) $273896,940246,444444,123456$

Descending form :
$\square$
e) $77777,777,777777,7777777$

Descending form :
3. Write the numbers in each row in ascending and descending form.
a) $2922,4786,2386,9762$

Ascending form :
238642922

Descending form :
97624236
b) $4007,7004,4070,7040$

Ascending form :


Descending form :

c) $9876,6789,7869,7986$

Ascending form :


Descending form :

d) $23450,9860,2486,399$

Ascending form :


Descending form :

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## Expanded form of numbers

| Type of Note $\rightarrow$ | 10000 Rupee notes | 1000 Rupee notes | 100 Rupee notes | 10 Rupee notes | 1 Rupee notes |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Number of notes | 2 | 5 | 3 | 4 | 1 |
| Value | 20000 | ............... | ............ | $\ldots$ | . |
| Value as product | $2 \times 10000$ | ............... | ............... | ............... | . |
| Expanded form |  |  |  |  |  |
| Number | 25341 |  |  |  |  |


| Type of <br> Note | 10000 <br> Rupee <br> notes | 1000 <br> Rupee <br> notes | 100 <br> Rupee <br> notes | 10 <br> Rupee <br> notes | 1 <br> Rupee <br> notes |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Number <br> of notes | 3 | 4 | 8 | 0 | 5 |
| Value |  |  |  |  |  |
| Value <br> as product |  |  |  |  |  |
| Expanded <br> form |  |  |  |  |  |
| Number |  |  |  |  |  |


| Type of <br> Note | 10000 <br> Rupee <br> notes | 1000 <br> Rupee <br> notes | 100 <br> Rupee <br> notes | 10 <br> Rupee <br> notes | 1 <br> Rupee <br> notes |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Number <br> of notes |  |  |  |  |  |
| Value |  |  |  |  |  |
| Value <br> as product |  |  |  |  |  |
| Expanded <br> form | $7 \times 10000+2 \times 1000+5 \times 100+2 \times 10+9 \times 1$ |  |  |  |  |



Write 156 in expanded form

$$
156=100+50+6
$$

Write in expanded form using ' $x$ '

$$
156=1 \times 100+5 \times 10+6
$$

Write the following numbers using expanded form









Look at the numbers written below in the placement box from (in houses). Write the same numbers in expanded form.

| Number | L | Tth | Th | H | T | O |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3,251 |  |  | 3 | 2 | 5 | 1 |
| 23,000 |  | 2 | 3 | 0 | 0 | 0 |
| $1,50,000$ | 1 | 5 | 0 | 0 | 0 | 0 |
| $2,35,746$ | 2 | 3 | 5 | 7 | 4 | 6 |
| $2,10,200$ | 2 | 1 | 0 | 2 | 0 | 0 |
| $1,30,056$ | 1 | 3 | 0 | 0 | 5 | 6 |
| $5,65,000$ | 5 | 6 | 5 | 0 | 0 | 0 |
| 277 |  |  |  | 2 | 7 | 7 |

$3,251=3 \times 1000+2 \times 100+5 \times 10+1 \times 1$
$23,000=$
$1,50,000=$

2,35,746 =
$2,10,200=2 \times 100000+1 \times 10000+2 \times 100+0 \times 10+0 \times 1$

1,30,056 =

5,65,000 =

$$
277 \text { = }
$$

## Expanded form of numbers

1. Write the expanded form of the given number.

| Number | Expanded Form |
| :---: | :---: |
| a) 8642 | $8 \times 1000+6 \times 100+4 \times 10+2 \times 1$ |
| b) 35842 |  |
| c) 473062 |  |
| d) 407982 |  |

2. Write the numeral form of the given expanded form.

| Expanded Form | Numeral |
| :---: | :---: |
| a) $4 \times 1000+5 \times 100+9 \times 10+6 \times 1$ | 4596 |
| b) $7 \times 10000+3 \times 1000+5 \times 100+4 \times 10+1 \times 1$ |  |
| c) $8 \times 10000+0 \times 1000+3 \times 100+9 \times 10+2 \times 1$ |  |
| d) $9 \times 100000+0 \times 10000+0 \times 1000+$ |  |
| $3 \times 100+4 \times 10+5 \times 1$ |  |

Write the given number in different loose forms and write each form in words.

Number 1000:

| Thousands | Hundreds | Tens | Units | Description |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 0 | 0 | 0 | One Thousand |
|  | 10 | 0 | 0 | Ten Hundreds |
|  |  | 100 | 0 | . |
|  |  |  | 1000 | ...................... |

Number 10000:

| Ten Thousands | Thousand | Hundred | Tens | Units | Description |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 0 | 0 | 0 | 0 | ............... |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  | ............ |
|  |  |  |  |  |  |

Number 100000:

| One <br> Lakhs | Ten Thousands | Thousand | Hundred | Tens | Units | Description |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 0 | 0 | 0 | 0 | 0 |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  | ........... |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |


| Loose form | Tight form |
| :---: | :---: |
| 100 units | 1 hundred |
| 10 tens |  |
| 100 tens |  |
| 100 hundreds |  |
| 100 thousands |  |

Write the commas according to Indian and International Systems and write the numbers in words.

| Indian System | International System |
| :---: | :---: |
| Four lakh seventy five thousand <br> three hundred and twenty one | 'Four hundred and seventy five' <br> Thousand three hundred and <br> twenty one |
| 400000 | 400000 |
| $40,00,000$ | 4000000 |
| Forty Lakhs | Four millions |
| 2304505 | 2304505 |
|  |  |
| 55555555 | 5555555 |

## International system

## Write in numerals :

a) 1 Thousand =
b) 10 Thousand = $\square$
c) 100 Thousand =

d) 1 Million =
e) 10 Million $=$
f) 100 Million $=$

g) 100 Million $=$

h) 1 billion =
I) 10 billion $=$
j) 100 billion =


## Indian and international system

Write in numerals :
a) 1 Thousand =

b) 10 Thousand =

c) 1 Lakh =
d) 10 Lakh $=$
e) 1 Crore =
f) 10 Crore $=$


Match the following :
100 Thousand
10 Crore
1 million
10 million
10 Lakh
100 million
1 Crore

## Estimation

Round off the given numbers to the nearest tens :

| Number | Rounding off to the nearest tens |
| :---: | :---: |
| a) 32 | 30 |
| b) 38 | 40 |
| c) 57 |  |
| d) 296 |  |
| e) 7925 |  |

Round off the given numbers to the nearest hundreds :

| Number | Rounding off to the nearest hundreds |
| :--- | :---: |
| a) 814 | 800 |
| b) 251 | 300 |
| c) 5780 |  |
| d) 7928 |  |
| d) 3008 |  |

## Estimation of Sum, Difference and multiplication

Estimate the addition of the following using general rule.


Round off
b) $796-314=$


Round off
c) $21 \times 49$


Estimation of Answer


Round off
d) $125 \times 95$


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## Distributive Property


$5 \times 3=15$
$\longleftarrow 3+2$


3
$(3 \times 3)+(2 \times 3)$

$$
\begin{aligned}
5 \times 3 & =(3+2) \times 3 \\
& =(3 \times 3)+(2 \times 3) \\
& =6+9 \\
& =15
\end{aligned}
$$


$6 \times 2=\square$

$=(\square \times 2)+(\square \times 2)$
$6 \times 2=(\square+\square \times 2$
$=(\square \times 2)+(\square \times 2)$
$=\square+\square$
$=\square$
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Mark the terms in the following expressions and solve.

|  | $\underline{3 \times 5}-2$ | $\underline{2} \times 3+4$ |
| :--- | :--- | :--- |
| $=15-2$ | $=$ | $=$ |
| $=13$ | $=$ | $2+\underline{3 \times 4}$ |
|  | $2 \times 3+4 \times 2$ | $=$ |
| $=$ | $=$ | $=$ |
| $=$ | $=$ | $10+3 \times 3$ |

$\ddot{\mathbf{Y}}$ Brackets are to be solved first (from inner most to outermost)


Solve.


Solve.

| $3+\frac{(4+2)}{3}$ | $\frac{(3+4+2)}{3}$ | $2+(3+3) \div 2$ |
| :---: | :---: | :---: |
| = | = | = |
| $(3+3) \div 2+1$ | $\begin{aligned} & 2 \times 2+(2+3) \\ = & \\ = & \end{aligned}$ | $\begin{aligned} & 2 \times 2 \times 2+3 \\ = & \\ = & \end{aligned}$ |
| $\frac{1}{2} \times(3+3)$ | $\frac{1}{2} \times 2 \times 2$ | $\frac{1}{2} \times \frac{1}{3}$ |
| = | = | $=$ |
| $2 \times 3+2 \times 2$ | $2 \times 2+2 \times 3+2 \times 4$ | $2 \times 2+6 \div 3$ |
| - | = | = |
| - | = | = |
| = | = | = |

Solving the expanding brackets.

$$
\begin{aligned}
2 \times 13 & =2 \times(\sqrt{0}+3) \\
& =(2 \times 10)+(2 \times 3) \\
& =20+6=26
\end{aligned}
$$

$5 \times 103=5 \times(\square+\square)$

$$
\begin{aligned}
& =(\square \times \square)+(\square \times \square) \\
& =\square+\square=\square
\end{aligned}
$$

$203 \times 2=(\square+\square) \times 2$

$$
\begin{aligned}
& =(\square \times 2)+(\square \times 2) \\
& =\square+\square=\square
\end{aligned}
$$

$115 \times 2=(\square+\square) \times 2$

$$
\begin{aligned}
& =(\square \times 2)+(\square \times 2) \\
& =\square+\square=\square
\end{aligned}
$$

$15 \times 12$

$=15 \times 12$

$$
=(10+5)+(10+2)
$$

$$
=10 \times(10+2)+5 \times(10+2)
$$

$$
=10 \times 10+10 \times 2+5 \times 10+5 \times 2
$$

$$
=\square+\square+\square+\square
$$

$$
=\square
$$

$23 \times 15$


$$
=23 \times 15
$$

$$
=(20+3)+(10+5)
$$

$$
=20 \times(10+5)+3 \times(10+5)
$$

$$
=20 \times 10+20 \times 5+3 \times 10+3 \times 5
$$

$$
=\square+\square+\square+\square
$$

$$
=\square
$$

$16 \times 25$

$$
\begin{aligned}
& =16 \times 25 \\
& =(10+6) \times(20+5) \\
& =\square \times(\square+\square)+\square \times(\square+\square) \\
& =\square \times \square+\square \times \square+\square \times \square+\square \\
& =\square+\square+\square+\square \\
& =\square
\end{aligned}
$$

## Roman Numerals

1 to 10

| I | II | III | IV | V | VI | VII | VIII | IX | X |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 3 |  |  |  |  |  |  |  |


| I | $V$ | $X$ | $L$ | $C$ | $D$ | $M$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 5 | 10 | 50 | 100 | 500 | 1000 |


| II | $X X$ | $X X X$ | $L X$ | $L X X$ | $L X X X$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 2 |  |  |  |  |  |

Write numbers 1 to 50 using roman numerals.

| I | XI | XXI | XXXI | XLI |
| :---: | :---: | :---: | :---: | :---: |
| II |  |  |  |  |
| III |  |  |  |  |
|  |  |  |  |  |
| $V$ | $X V$ |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| $I X$ |  |  |  |  |
| $X$ | $X X$ | $X X X$ | $X L$ | L |

## Natural Numbers

## Natural numbers $=\{1,2,3,4, \ldots . .$.

a) Write any five natural numbers :

b) Write the smallest natural numbers :

c) Show natural numbers on the number line.

d) Solve and check whether your answer is a natural number or not.:

|  | Is answer a natural <br> number ? (Yes / No) |
| :--- | :--- |
| $3+2=\square$ |  |
| $2-5=\square$ |  |
| $3 \times 4=\square$ |  |
| $1 \div 2=$ |  |

e) Is zero a natural number ?

> Yes / No

## Whole Numbers

## Whole numbers $=\{0,1,2,3, \ldots . . . . .$.

a) Write any five whole numbers :

b) Write the smallest whole number :

c) Show whole numbers on the number line.

d) Solve and check whether your answer is a whole number or not.:

|  | Is answer a whole <br> number ? (Yes / No) |
| :--- | :--- |
| $2+0=\square$ |  |
| $0-5=\square$ |  |
| $0 \times 3=\square$ |  |
| $2 \div 0=$ cannot be done |  |

e) Is zero a whole number?

Yes / No

Fill in the blanks.
a) $2 \times 3=\square \times 2$
b) $2+3=\square+2$
c) $2 \times(3+4)=2 \times \square+2 \times \square$
d) $5+0=\square$
e) $5 \times 0=\square$
f) $5+1=\square$
g) $5-0=\square$
h) $5 \div 0=$ Not defined.
i) The smallest natural number is $\square$
j) The smallest whole number is $\square$
k) $3+(2+4)=(3+2)+$

I) $3 \times(2 \times 4)=(3 \times 2) x$ $\square$

Draw dots in the grid to make squares. Write the numbers that make squares.




| $4^{2}=$ |  |  |  |  |
| :--- | :--- | :--- | :--- | :---: |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |


| $5^{2}=\square$ |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :---: |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |


| Number | Square |
| :---: | :---: |
| 1 | 1 |
| 2 | 4 |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 9 |  |
| 10 |  |
| 9 |  |

Draw dots in the grid to make rectangles. Write the numbers that make rectangles.

6

$\square$


Draw dots in the grid to make triangles Write the numbers that make triangles.


Draw dots and write the next three triangular numbers :

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\|c\| c \mid$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



Factors
Take the given number of unit cubes. Make equal parts in different ways. Write the factors.

| Number | Numbers of equal parts |  |
| :---: | :---: | :---: |
| 6 |  |  |
| 8 |  |  |
| 10 |  |  |
| 11 |  | $\begin{gathered} 11 \\ \square \square \square \square \square \square \square \square \square \square \square \end{gathered}$ |
| 12 |  |  |
| 14 |  |  |
| 15 |  |  |
| 9 |  |  |
| 16 |  |  |
| 17 |  |  |
| 18 |  |  |
| 19 |  |  |
| 20 |  |  |
| 21 |  |  |
| 22 |  |  |
| 23 |  |  |
| 24 |  |  |

Multiples
Keep adding the number to itself using cubes/rods/notes. Write the multiples.

| Number | Multiples |
| :---: | :---: |
| 2 | $2,4,6,8,10,12,14 \ldots$ |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 10 |  |
| 20 |  |
| 100 |  |
| 200 |  |
| 50 |  |
| 15 |  |
| 30 |  |
| 40 |  |
| 8 |  |
| 9 |  |
| 11 |  |

Match the following.

8

15

28

3

Multiple of 5
Multiple of 7

Factor of 9

Factor of 16

Write first five multiples of the following numbers.

| Number | Multiples |
| :---: | :--- |
| 10 |  |
| 12 |  |
| 7 |  |

Write all factors of the following numbers.

| Number | Factors |
| :---: | :---: |
| 16 |  |
| 20 |  |
| 35 |  |
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| 1 | 11 | 21 | 31 | 41 | 51 | 61 | 71 | 81 | 91 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 | 12 | 22 | 32 | 42 | 52 | 62 | 72 | 82 | 92 |
| 3 | 13 | 23 | 33 | 43 | 53 | 63 | 73 | 83 | 93 |
| 4 | 14 | 24 | 34 | 44 | 54 | 64 | 74 | 84 | 94 |
| 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | 95 |
| 6 | 16 | 26 | 36 | 46 | 56 | 66 | 76 | 86 | 96 |
| 7 | 17 | 27 | 37 | 47 | 57 | 67 | 77 | 87 | 97 |
| 8 | 18 | 28 | 38 | 48 | 58 | 68 | 78 | 88 | 98 |
| 9 | 19 | 29 | 39 | 49 | 59 | 69 | 79 | 89 | 99 |
| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

1) Circle all multiples of 10 .

All have $\square$ in the unit's place.

Divisibility by $10 \longrightarrow$ The number has 0 in the units place.
2) Colour all multiples of 5 .

All have $\square$ or $\square$ in the unit's place.

Divisibility by $5 \longrightarrow$ The number has 0 or 5 in the units place.
3) Put a $\checkmark$ on all multiples of 2 .

Digits in the unit's place are $\square$

Divisibility by $2 \longrightarrow$ The number has $0,2,4$, 6 or 8 in the units place.

Observe the digit in unit's place and write whether the number is divisible by 10,5 and 2 .

| Number | Digit in Unit's Place | Divisible by |
| :---: | :---: | :---: |
| 20 | 0 | 10, 5, 2 |
| 18 | 8 | 2 |
| 15 | 5 | 5 |
| 9 |  |  |
| 24 |  |  |
| 69 |  |  |
| 23 |  |  |
| 121 |  |  |
| 36 |  |  |
| 50 |  |  |
| 100 |  |  |
| 95 |  |  |

Divisibility by 3 : Sum of digits of the number is a multiple of 3

| Number | Sum of digits | Is the sum multiple of 3 ? | Is the number divisible by 3 ? |
| :---: | :---: | :---: | :---: |
| 87 | $8+7=15$ | Yes | Yes |
| 135 | $1+3+5=9$ | Yes | Yes |
| 97 |  |  |  |
| 124 |  |  |  |
| 132 |  |  |  |
| 300 |  |  |  |
| 609 |  |  |  |
| 500 |  |  |  |
| 406 |  |  |  |
| 8121 |  |  |  |
| 5400 |  |  |  |
| 3531 |  |  |  |
| 12345 |  |  |  |

Divisibility by 6 : The number is divisible by 2 and 3 both

| Number | Digit in unit's place | Divisible by 2 ? | Sum of digits | Divisible by 3 ? | Divisible by 6 ? |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 42 | 2 | Yes | 6 | Yes | Yes |
| 69 | 9 | No | 15 | Yes | No |
| 91 |  |  |  |  |  |
| 78 |  |  |  |  |  |
| 108 |  |  |  |  |  |
| 300 |  |  |  |  |  |
| 509 |  |  |  |  |  |
| 1236 |  |  |  |  |  |
| 6060 |  |  |  |  |  |
| 9009 |  |  |  |  |  |
| 4811 |  |  |  |  |  |
| 7822 |  |  |  |  |  |
| 4044 |  |  |  |  |  |
| 30000 |  |  |  |  |  |
| ă Navnirmiti Learning Foundation |  |  |  |  |  |

Divisibility by 4 : Number formed by last two digits is a multiple of 4 .

| Number | Number formed by last 2 digits | Is the number formed by last 2 digits divisible by 4 ? | Is the original number divisible by 4 ? |
| :---: | :---: | :---: | :---: |
| 64 | 64 | Yes | Yes |
| 212 | 12 | Yes | Yes |
| 650 | 50 |  |  |
| 400 | 00 | Yes |  |
| 348 | 48 |  |  |
| 2516 |  |  |  |
| 3540 |  |  |  |
| 660 |  |  |  |
| 3844 |  |  |  |
| 12345 |  |  |  |
| 16850 |  |  |  |
| 33330 |  |  |  |
| 56120 |  |  |  |
| 19487 |  |  |  |
| 68531 |  |  |  |

Divisibility by 9 : Sum of the digits of the number is divisible by 9

| Number | Sum of the digits | Is the sum divisible by 9 ? | Is the number divisible by 9 ? |
| :---: | :---: | :---: | :---: |
| 81 | $8+1=9$ | Yes | Yes |
| 7893 | $\begin{aligned} & 7+8+9+3=27 \\ & \ln 27,2+7=9 \end{aligned}$ | Yes | Yes |
| 162 |  |  |  |
| 4536 |  |  |  |
| 4008 |  |  |  |
| 5762 |  |  |  |
| 3339 |  |  |  |
| 9999 |  |  |  |
| 7865 |  |  |  |
| 8901 |  |  |  |
| 5555 |  |  |  |
| 12348 |  |  |  |
| 10101 |  |  |  |

Write a three digit number which is divisible by 10


Write a four digit number which is divisible by 10

$\qquad$

Write a three digit number which is divisible by 2

$\qquad$

Write a four digit number which is divisible by 2


Write a three digit number which is divisible by 5


Write a four digit number which is divisible by 5

$\qquad$

Write a three digit number which is divisible by 3


Write a four digit number which is divisible by 3

$\qquad$

Write a three digit number which is divisible by 4


Write a four digit number which is divisible by 4

$\ddot{\mathbf{Y}}$ Draw the rectangles for the multiplication and write the multiplication for the rectangles :


Write the multiplication for given rectangles and draw the rectangles for given multiplication

## Multiples

Write the first 12 multiples of 3 :


Write the first 12 multiples of 4 :


Which are the multiples of 3 which are common to the multiples of 4 ?


Write the first 12 multiples of 5 :


Write the common multiples of 3 and 5 (till 60)


Write the common multiples of 4 and 5 (till 80)


Multiples
Write the first 12 multiples of $\frac{1}{2}$


Write the first 12 multiples of $\frac{1}{3}$


Write the first 12 multiples of $\frac{1}{4}$


Write the first 12 multiples of 10 :


Highest common factor by listing

HCF of 8 and 12 :
List the factors of each number.


12: (1) (2) 3 (4) 6 12
Circle the common factors.

Common factors are : 1, 2, 4

Highest (Largest) common factor is

HCF of 12 and 15
$12:$

15 :

HCF :

HCF of 24 and 36

HCF of 20 and 30

HCF of 16 and 24

HCF of 24 and 60

HCF by prime factorisation
HCF of 24 and 36 :

$$
\begin{array}{rlrl}
24 & =2 \times 12 & 36 & =2 \times 18 \\
& =2 \times 2 \times 6 & & =2 \times 2 \times 9 \\
& =\underline{2} \times \underline{2} \times 2 \times \underline{3} & & =\underline{2} \times \underline{2} \times \underline{3} \times 3
\end{array}
$$

Underline the common factors

$$
\text { HCF } \quad=2 \times 2 \times 3=12
$$

HCF of 24 and 30 :
$24=$
$30=$
$=\quad=$
$=$ =
HCF =


HCF of 16 and 24 :

HCF of 14 and 49 :

HCF of 15 and 17 :

A food shop sells ready-made rotis. Generally their customers buy 8 rotis or 12 rotis. How many rotis should they pack in one packet so that the customers can pick up packets and no bags are wasted?

There are two types of big cartons which take 32 or 48 mangoes. How many mangoes should be there in small boxes so that minimum number of boxes can be used to fill big cartons?

## LCM by listing (use calculator)

LCM of 24 and 36


Circle the common multiples

Common multiples are :
72, 144, $\qquad$

Least (smallest) common multiple (LCM) is

LCM of 24 and 90 :
Multiples of $24: \quad 24,48,72,96,120,144,168,192,216$,

$$
240,264,288,312,336,360
$$

Multiples of $90: \quad 90,180,270,360$

Common multiples are :

LCM is


LCM of 3 and 4

LCM of 6 and 12

LCM of 10 and 15

LCM of 15 and 20

LCM of 25 and 40

LCM of 36 and 60

LCM of 12 and 25

LCM by prime factors
LCM of 24 and 36

Factors of 24 and 36 :
$24=2 \times 12$
$=2 \times 2 \times 6$
$36=2 \times 18$
= (2) $\times$ (2) $2 \times 2$
$=2 \times 2 \times 9$
$=(2) \times(2) \times 3$

Circle the common factors

Underline the uncommon factors.
LCM = common factors x uncommon factors

$$
\begin{aligned}
& =(2) \times 2 \times(3) 2 \times 3 \\
& =72
\end{aligned}
$$

LCM of 24 and 90

LCM of 15 and 20

LCM of 25 and 40

LCM of 36 and 60

LCM of 12 and 25

Prime and composite numbers.

1) Make a rectangle with 12 cubes. Draw it:

2) Make a rectangle with 16 cubes. Draw it.

3) Make a rectangle with 20 cubes. Draw it.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Let's call rectangles with only one row as 'lines'. We will call rectangles with more than one row as 'broad rectangles'.

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## Can you make a broad rectangle with 7 cubes?

Can you make a broad rectangle with 11 cubes?

Numbers which cannot be arranged in a broad rectangle are called 'Prime numbers'. Numbers which can be arranged in a broad rectangle are called 'Composite numbers.'

Classify the following numbers into prime numbers and composite numbers :
$2,6,7,9,12,25,32,58,59,61,63,77,79,99,101,105$
(Also refer to the chart of multiplication tables to check whether a number is in tables of some other number. Such numbers are composite numbers.)

| Prime | Composite |
| :---: | :---: |
| 2, 7. | - 6. 9 |

## Drawing multiplication of factors



Draw the rectangle for $2 \times 3 \times 5$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | $\square$ |  |  |  | $\square$ |  |  |  |  |  |  |

Draw the rectangle for $2 \times 2 \times 2 \times 2$

|  |  |  |  |  |  |  |  |  |  |  | - |  | - | $\square$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | $\square$ |  |  |  |  |  |  |  | \| |  |  |  |  |

Draw the rectangle for a) $3 \times 3 \times 3 \times 2$
b) $2 \times 4 \times 3$


Match the following names with pictures :


Label the eight points shown here :
Label the two lines:


Write the names of all line segments seen in the figures:


Write the names of all line segments in the following figure :


Write the names of rays :


Write the names of collinear points :


Are the lines parallel or intersecting?


Observe the figure and fill in the blanks with the words parallel / intersecting.


Line $A$ and line $B$ are $\qquad$

Line $A$ and line $C$ are $\qquad$

Line $C$ and line $D$ are $\qquad$

Line $C$ and line $E$ are $\qquad$

Measure the length of the given line segments using a ruler. Write the length.


## Draw line segments of the given lengths :

length of $A B=8 \mathrm{~cm}$

$$
A \backsim B
$$

length of $B C=6 \mathrm{~cm}$
length of $D E=2 \mathrm{~cm}$
length of $X Y=4 \mathrm{~cm}$
length of $P Q=5 \mathrm{~cm}$
length of LM $=1 \mathrm{~cm}$
length of RS $=9 \mathrm{~cm}$
length of $\mathrm{OP}=3$ and a half cm

Write the names of vertices, sides, diagonals and angles.

Vertices: 1)
2) $\qquad$
3) $\qquad$ 4)
Sides: 1) $\qquad$
2) $\qquad$ 3) $\qquad$ 4) $\qquad$
Diagonals: 1)
2) $\qquad$
Angles: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$


Vertices: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$ 5) $\qquad$
Sides: 1)
). 2) $\qquad$ 3) $\qquad$ 4) $\qquad$ 5) $\qquad$
Diagonals: 1) $\qquad$ 2)
).
.. 3) $\qquad$ 4) $\qquad$ 5)

Angles: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$ 5)


Vertices: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$
Sides: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$
Diagonals : 1) $\qquad$ 2) $\qquad$
Angles: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$


Vertices: 1) $\qquad$ 2) $\qquad$ 3) $\qquad$ 4) $\qquad$
Sides: 1)
1)
2) $\qquad$
3)
4) $\qquad$
Diagonals: 1)
2) $\qquad$
Angles: 1)
).
2)
). $\qquad$ 3) $\qquad$ 4) $\qquad$

Write the type of each angle (Right angle, Acute angle, Obtuse angle,Straight angle)


Measure the following angles using a protractor :


## Draw angles of the given measures:

$$
90^{\circ} \quad 120^{\circ}
$$

$60^{\circ}$
$30^{0}$
$140^{\circ} 180^{\circ}$

Observe the figures and answer the questions.

Vertices:1)
2)
3) $\qquad$
Sides: 1)
2)
2) $\qquad$ 3) $\qquad$
In $\triangle \mathrm{PQR}$ :
Vertices: 1)
2)
3)
Sides: 1)
2)
3)
Angles: 1)
2)
3)


B
D
Write the names of three triangles in the figure
1)
2)
3)
Write the names of six line segments.
1)
2)
3) $\qquad$
4)
5)
6) $\qquad$

Which two triangles have LB as common?
$\qquad$
Which two triangles have LC as common?

LBAD is an angle of which triangle ?

LDAC is an angle of which triangle?

LBAC is an angle of which triangle?

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How many triangles are there in the above figure. Write their names.
$\qquad$
$\qquad$


How many triangles? Write their names.
$\qquad$
$\qquad$
$\qquad$


D
Vertices : 1)2)
$\qquad$ 3) $\qquad$ 4) $\qquad$Sides: 1)2)
$\qquad$3)
$\qquad$ 4) $\qquad$Angles : 1)2)3)
$\qquad$4)4)
$\qquad$
Adjacent Sides: 1) AB and BC
2) $\qquad$
3)

4) 

$\qquad$Opposite Sides: 1) AB and CD
2) $\qquad$Diagonals: 1)
$\qquad$2)
$\qquad$


1) All angles are right angles / acute angles.
2) Opposite sides are same / different.
3) Adjacent sides are same / different.

4) The centre of circle : $\qquad$
5) A diameter : $\qquad$
6) Radius of circle : 1)
7) $\qquad$
8) $\qquad$
9) Chord: 1) $\qquad$ 2) $\qquad$
10) Point in the interior : 1)
11) $\qquad$
12) Point in the exterior : 1)
13) 
14) A sector: $\qquad$
15) A segment : $\qquad$

Draw a circle. Draw and label the following centre, radius, diameter, chord.

Name the type of triangle based on angles.


Draw rough sketch

| Right angled triangle | Acute angled triangle | Obtuse angled triangle |
| :--- | :--- | :--- |
|  |  |  |
|  |  |  |
|  |  |  |

Match the following.

Measure of right angle
$>180^{\circ}$

Measure of acute angle

Measure of obtuse angle

Measure of straight angle

Measure of reflex angle $<90^{\circ}$

Find the measure of $\angle A B C$


Find the measure of $\angle P Q R$


Types of Triangles based on sides:

Equilateral triangle - $\qquad$ sides are equal.

Isosceles triangle - $\qquad$ sides are equal.
$\qquad$ .triangle - All three sides are unequal.

Types of Triangles based on angles :

Acute angled triangle - $\qquad$ angles are less than $90^{\circ}$.
$\qquad$ triangle - One angles is $90^{\circ}$.

Obtuse angled triangle - One angle is $\qquad$

Draw rough sketch

| Equilateral triangle | Isoceles triangle | Scalene triangle |
| :--- | :--- | :--- |
|  |  |  |
|  |  |  |
|  |  |  |

Match the following.


Scalene triangle

Equilateral triangle

Right angled triangle


Obtuse angled triangle

Isosceles triangle

Acute angled triangle

## Parallelogram



Are opposite sides equal ? $\qquad$
Are opposite sides parallel? $\qquad$
Are all sides equal? $\qquad$
Are opposite angles equal? $\qquad$
Are diagonals equal?
Are diagonals perpendicular? $\qquad$

## Rectangle



## Are opposite sides equal ?

$\qquad$
Are opposite sides parallel? $\qquad$
Are all sides equal ? $\qquad$
Are opposite angles equal? $\qquad$
Are diagonals equal? $\qquad$
Are diagonals perpendicular? $\qquad$

## Square



Are opposite sides equal ? $\qquad$
Are opposite sides parallel? $\qquad$
Are all sides equal? $\qquad$
Are opposite angles equal? $\qquad$
Are diagonals equal? $\qquad$
Are diagonals perpendicular?

## Rhombus



Are opposite sides equal? $\qquad$
Are opposite sides parallel? $\qquad$
Are all sides equal ? $\qquad$
Are opposite angles equal? $\qquad$
Are diagonals equal? $\qquad$
Are diagonals perpendicular? $\qquad$

## Trapezium



Are opposite sides equal? $\qquad$
Are opposite sides parallel? $\qquad$
Are all sides equal ?
Are opposite angles equal? $\qquad$
Are diagonals equal? $\qquad$
Are diagonals perpendicular? $\qquad$

| Picture | Name | Faces | Vertices | Edges |
| :---: | :---: | :---: | :---: | :---: |
|  | Cuboid | 6 |  | 8 |

Match the following


What shape is
a) Roshogulla or Laddu
b) A brick
c) A ball


Write the value of bank account :


Write the positive and negative numbers on the number line :


Write the number after :


Write the number before :


Write the numbers in sequence :


Write the values of following quantities and compare them using signs <, >, =


Compare the following integers using <, >, =


Represent the following numbers on the number line :

$$
-5, \quad+6, \quad-2, \quad 0, \quad+5
$$



Represent the following temperatures on the number line :

$$
15^{0}, \quad 30^{\circ}, \quad-10^{0}, \quad-15^{0}, \quad-30^{\circ}
$$



Represent the following amounts on the number line.

$$
200, \quad-200, \quad 0, \quad+400, \quad-300
$$


$-100100$

Represent the following numbers on the number line.

$$
+100, \quad+150, \quad-50, \quad-150, \quad-300
$$



Make bank accounts having the value zero :


Make bank accounts having the value +2 :


Make bank accounts having the value - 2 :


Add the numbers and write the answers.

$$
\begin{aligned}
& +1+1+1+1+1+(+3) \\
& (+2) \\
& +\quad+1)
\end{aligned}
$$

$+1+++1+1+1$

$$
(\quad) \quad+\quad(\quad) \quad=(\quad)
$$

$+1+-1+1$
( ) + ( ) = ( )

$$
\begin{aligned}
& -(-1)+-1)=\binom{1}{(1)}
\end{aligned}
$$

(-1) -1 -1 +-1 -1 -1

Write in two forms:

$$
\begin{aligned}
& +1+1+1+1 \\
& +-1+-1+1
\end{aligned}
$$

(-1) -1 -1 -1
$++1+1+1$

$$
\begin{aligned}
& \text { (-1)-1 -1 -1 } \\
& +-1-1-1
\end{aligned}
$$

$$
\begin{aligned}
& +1+1+1+1+1 \\
& ++1+1+1
\end{aligned}
$$

$$
\begin{aligned}
& +1+1+1+1+1 \\
& +-1-1-1+1-1
\end{aligned}
$$



Solve as shown :

1) $+3+2=+1+1+1+1+1=++5$
2) $+4+2=+1+1+1+1+1+1=\square$
3) $+1+5=$ $\qquad$ $=\square$

Rule : When you have two positive numbers in your account, add the numbers and give a positive sign.

Solve using rule :

1) $+3+4=\square$
2) $+2+5=\square$
3) $+0+5=\square$
4) $+2+10=\square$

Solve as shown :

1) $-2-3=-1-1-1-1-1=-5$
2) $-4-2=$ $\qquad$
$\square$
3) $-3-1=$ $\qquad$ $=\square$

Rule : When you have two negative numbers in your account, add the numbers and give a negative sign.

Solve using rule :

1) $-3-4=\square$
2) $-5-1=\square$
3) $0-5=$

4) $-10-3=\square$
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Solve as shown :

1) $+5-3=+1+1+\gamma+1+\not-1-1-1-1=+2$
2) $-5+2=$ $\qquad$ $=$

3) $+6-1=$ $\qquad$ $=\square$
4) $-6+3=$ $\qquad$ $=\square$

Rule : When you have one positive and one negative number in your account, take their difference and give the sign of the bigger number.

Solve using rule :

1) $+7-2=\square$
2) $+6-4=\square$
3) $-8+3=\square$
4) $-7+3=\square$
5) $0-4=\square$
$6)+5-0=\square$
6) $+10-3=$
7) $-10+3=\square$
8) $-5+1=\square$
9) $+5-1=\square$

Rules for finding value of the account.

1)     + and $+\longrightarrow \quad+$ addition
2)     - and - $\longrightarrow$ - addition
$3)+$ and $-\quad$ (sign of the bigger number) and (difference)

Use appropriate rule and solve.

| Problem | Signs | Rule No. | Answer |
| :---: | :---: | :---: | :---: |
| $+5-2$ | + , - | 3 | + 3 |
| $-8-2$ | - , - | 2 |  |
| $+6+4$ |  |  |  |
| $-7+3$ |  |  |  |
| $-7-3$ |  |  |  |
| $+7-3$ |  |  |  |
| $+7+3$ |  |  |  |
| $-4-5$ |  |  |  |
| $+5-4$ |  |  |  |
| $-5+4$ |  |  |  |
| $+4+5$ |  |  |  |

Solve

1) $+8+3$
2) $-8-3$
3) $-8+3$
4) $+5-10$
5) $-20+10$
6) $-10-10$
7) $+10-10$
8) $-5+10$
9) $+5+3-2$
10) $-6-2+4$
11) $-3+2+1$
12) $-5+5-2$
13) $-4+4-2-1$
14) $+3-2-3+2$

While adding numbers, all signs remain the same if you remove the brackets.

$$
(+2)+(+3)=+2+3=+5
$$

$$
(-5)+(-1)=-5-1=\square
$$

$$
(-3)+(+2)=
$$

$\qquad$ $=$
$(-6)+(-2)=$ ..... $=$


$(+6)+(-2)=$ $=$

$(-8)+(+2)=$ $\qquad$ $=$

$(-5)+(-2)=$ $=$

$(+2)+(-3)+(+1)=$ $\qquad$ $=$

$(-2)+(-1)+(-3)=$ $\qquad$
$\square$
$(+1)+(+2)+(+3)=$ $\qquad$
$\square$
$(-1)+(-1)+(-2)=$ $\qquad$
$\square$
$(-2)+(-2)+(+4)=$ $=\square$


Remove -3


Subtracting a positive number is like adding a negative number. Subtracting a negative number is like adding a positive number.
(A note for teachers - Do the activities to explain why.)

Subtracting a positive number is like adding a negative number*.

Subtracting a negative number is like adding a positive number*.

$$
\begin{aligned}
& (+5)-(-2)=+5+2=\square \\
& (-5)-(-2)=-5+2=\square
\end{aligned}
$$

$$
(-8)-(-8)=\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots
$$

$$
(+2)-(-2)=\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots
$$

$$
(-3)-(-2)=
$$

$\qquad$
$\square$
*A note for teacher - Do the activities to explain why. Taking away rupees reduces the value of your account. Taking away loan increases the value.

$$
\begin{aligned}
& (+3)-(+1)=+3-1=++2 \\
& (-5)-(+2)=-5-2=\square \\
& (+6)-(+6)=\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \\
& (+10)-(+2)= \\
& =\square \\
& (-10)-(+2)=
\end{aligned}
$$

Make equal parts
Use paper rotis
Divide the rotis equally and draw the picture of what each one gets.

| Division | Read as | Divide by drawing circles among rotis | $\begin{aligned} & \text { Each one } \\ & \text { gets } \end{aligned}$ |
| :---: | :---: | :---: | :---: |
| $\frac{6}{3}$ | Six by three |  |  |
| $\frac{4}{2}$ |  |  |  |
| $\frac{2}{2}$ |  |  |  |
| $\frac{1}{2}$ |  | $\square$ |  |
| $\frac{1}{4}$ |  |  |  |
| $\frac{1}{8}$ |  |  |  |
| $\frac{3}{2}$ |  |  |  |
| $\frac{5}{2}$ |  |  |  |
| $\frac{3}{4}$ |  |  |  |
| $\frac{5}{4}$ |  |  |  |

What fraction of the whole is the shaded part?

| Division in picture | Number of <br> Rotis/Cakes | Divided <br> equally among | Division in <br> numerals |
| :--- | :--- | :--- | :--- |
|  |  |  |  |

Write the coloured portion as a fraction.



This is one whole Roti.

## Multiplying a fraction

 Match the pairs.

Match the pairs


Write the shaded fraction


$$
\frac{1}{2} \text { taken } 1 \text { times }=\frac{1}{2}
$$



Write the shaded fractions in numerals.


Show the given fraction by shading.

$\frac{3}{4}$

$\frac{8}{8}$

$\frac{9}{8}$


Show the given fraction by making parts and shading.


Search for the pieces corresponding to following fractions in fraction kit. Write in various forms.
While counting using a fraction as a unit, all pieces have to be of the same value.

| In form of addition | Description | Unit of <br> counting | Number <br> of <br> pieces | In form of <br> multipli- <br> cation | Fraction |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$ | 3 pieces of $\frac{1}{4}$ | $\frac{1}{4}$ | 3 | $3 \times \frac{1}{4}$ | $\frac{3}{4}$ |
| $\frac{4}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}$ |  |  |  |  |  |
| $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$ |  |  |  |  |  |
| $\frac{1}{4}+\frac{1}{6}$ |  |  |  |  |  |
| $\frac{1}{8}+\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$ |  |  |  |  | $\frac{6}{8}$ |
|  |  |  |  |  |  |

Fractions greater than 1 (A circle or a square is one whole)


Match the fractions having the same value.


Fractions having the same value:


Multiply numerator and denominator by the same number to get equivalent fractions. Show your fraction by making parts and shading.

Tight form


$$
\frac{1}{2}=\frac{1 \times 2}{2 \times 2}=\frac{2}{4}
$$



$$
\frac{1}{2}=\frac{1 \times 3}{2 \times 3}=\frac{3}{6}
$$

## Loose form



Now make your own equivalent fractions




Divide the numerator and denominator by the same number to get equivalent fractions in tight form.

$$
\begin{aligned}
& \frac{4}{8}=\frac{4 \div 4}{8 \div 4}=\frac{4}{2} \\
& \frac{3}{9}=\frac{3 \div 3}{9 \div 3}=\frac{\square}{\square} \\
& \frac{4}{6}=\frac{4 \div \square}{6 \div \square}=\frac{\square}{\square} \\
& \frac{10}{100}=\frac{10 \div \square}{100 \div \square}=\frac{\square}{\square} \\
& \frac{4}{12}=\frac{4 \div \square}{12 \div \square}=\frac{\square}{\square} \\
& \frac{8}{16}=\frac{8 \div \square}{16 \div \square}=\frac{\square}{\square} \\
& \frac{6}{10}=\frac{6 \div \square}{10 \div \square}=\frac{\square}{\square} \\
& \frac{12}{18}=\frac{12 \div \square}{18 \div \square}=\frac{\square}{\square}
\end{aligned}
$$

Show the following fractions on the line segment below.



Which fractions lie on the point of $3 / 2$ ?


Which fractions are equivalent to $2 / 4$ ?


Which fractions do you see at the position of 1 ? 2/2 $\square$
$\square$
Which fractions do you see at the position of 2 ? $\square$
$\square$
$\square$

Show the following fractions on the line segment below.
$\frac{1}{12} \quad \frac{2}{12} \quad \frac{5}{12} \quad \frac{6}{12} \quad \frac{8}{12} \quad \frac{1}{3} \quad \frac{2}{3} \quad \frac{3}{3} \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4} \quad \frac{5}{4} \quad \frac{1}{6} \quad \frac{2}{6} \quad \frac{3}{6} \quad \frac{5}{6} \quad \frac{1}{2}$


Which fractions lie on the point of $1 / 2$ ? $\square$
$\square$
Which fractions are equivalent to $2 / 4$ ? $\square$
$\square$
Which fractions do you see at the position of 1 $\square$ 2/2 $\square$
Which fractions do you see at the position of 2 ? $\square$

## Do the following activity using Jodo Blocks -

One whole chocolate is of this size : $\square$
The unit of counting is $\square$ i.e. $1 / 4$. Make and colour the following fractions using this $1 / 4$ as counting unit : $1 / 4,2 / 4,3 / 4,4 / 4,5 / 4,6 / 4,7 / 4,8 / 4$


Make and colour 1/2, 2/2, 3/2, 4/2 of this chocolate -


Unit of counting will be $1 / 2$ which is


If one whole is
 write the following fractions in numerals -


One whole chocolate slab is shown in the picture. Colour the following fractions $1 / 2,2 / 2,3 / 2,1 / 3,2 / 3,3 / 3,4 / 3,1 / 6,2 / 6,3 / 6,4 / 6,5 / 6,6 / 6$, 1/4, 2/4, 3/4, 4/4, 5/4, 6/4


Coloured piece is $2 / 3$ of a full chocolate slab. Colour the whole chocolate slab.
Also colour 1/3 chocolate.


This is one whole chocolate slab. Colour separately 5/9.


A group of children -


| Part | Number of children |
| :---: | :---: |
| Whole group |  |
| $1 / 9$ | 4 |
| $1 / 6$ | 12 |
|  | 1 |

## Do the following activity using jodo blocks and make pictures :

- If one whole is made of 4 blocks like this $\square$ , we can make two equal parts and 4 equal parts. But we cannot make 3 equal parts of this whole.

Make and colour a whole of which we can make 2 equal parts.

Make and colour a whole of which we can make 3 equal parts.


Make and colour a whole of which we can make 2 equal parts and 3 equal parts.


Make and colour a whole of which we can make 2, 3 and 4 equal parts.


Write the values of these fractions if they are parts of the whole made of 12 blocks -


Keeping in mind the whole and also the unit of counting, write the fractions



Observe the pictures of Jodo Blocks and write the addition and answer



Observe the pictures of Jodo Blocks and write the addition and answer



## $1 / 2+1 / 3=$ ?

For solving this, take a whole made of jodo blocks of which we can make 2 equal parts as well as 3 equal parts. Take the smallest whole possible.
Colour the parts and colour and write the the addition.

1 whole =
$1 / 2=$
$1 / 3=$
$1 / 2+1 / 3=$



 $1 / 2+$ $\square$

 Answer in numerals =

## $2 / 5+1 / 3=?$

For solving this, take a whole made of jodo blocks of which we can make 5 equal parts as well as 3 equal parts. Take the smallest whole possible.

Colour the parts and colour and write the the addition.


Answer in numerals =

Use jodo blocks to do the additions and fill in the blanks.

$\frac{1}{2}+\frac{3}{4} \rightarrow$


Draw jodo blocks to do the additions and fill in the blanks.

$\frac{1}{2}+\frac{2}{5} \rightarrow$

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## Observe the parts and make 1 by addition


If half $(1 / 2)$ of some work is done, how much work is remaining?
Half of the class of 40 are girls. How many boys are there in the class? $\square$

There is rice sown in $3 / 4$ of a farm plot. How much of the plot is left for vegetables?

Subtract: 3/5 - 1/5

Choose one whole. Colour it -

Colour $3 / 5$ of it -

Cross out $1 / 5$ to show cancellation-


Colour the remaining part -

Answer in numerals $=\frac{2}{5}$
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## Subtract : 5/7 2/7

Choose 1. Colour it -

Colour $5 / 7$ of it -

Cross 2/7-

Colour the remaining part -

Answer in numerals =

Subtract: 7/10-1/5
Choose 1. Colour it -

Colour 7/10 of it -

Cross 1/5 -

Colour the remaining part -


Answer in numerals =

## Subtract: 3/2 - 1/4

Choose 1. Colour it -

Colour $3 / 2$ of it -

## Cross 1/4 -

Colour the remaining part -
The length of one foot was measured.

## It is shown on the grid below as 1 whole length.

Draw line segments showing all other lengths.

Draw line segments of the following lengths in cm .


## From Fractions to Decimal Fractions



On the above number line the positions of $\frac{1}{2}, 1$ and 2 are shown, and written.

Show and write the positions of the following fractions by putting points on the number line :

$$
\frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \frac{4}{2}
$$



Show and write the positions of the following fractions by putting points on the number line:

$$
\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}
$$



Show and write all the above fractions on the following number line :

$$
\frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}
$$



Put the appropriate symbol <, >, $=$, in the box.

$$
\frac{2}{4} \square \frac{1}{2}, \frac{1}{4} \square \frac{1}{2}, \frac{2}{2} \square \frac{3}{4}, \frac{3}{2} \square \frac{6}{4}, \frac{5}{4} \square 2
$$

Show and write the positions of the following fractions by putting points on the number line:

$$
\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8} \frac{7}{8}, \frac{8}{8}, \frac{9}{8}
$$



Show and write the positions of the following fractions by putting points on the number line :

$$
\frac{1}{16}, \frac{2}{16}, \frac{3}{16}, \frac{4}{16}, \frac{8}{16}, \frac{15}{16} \frac{16}{16}, \frac{17}{16},
$$



## Answer the following Questions

1. Which is the smallest fraction on this page?
2. Which is the largest fraction on this page?
3. Write the pairs of equal fractions :
4. Write the fractions which are equal to $\frac{1}{2}$
5. Write all the above fractions in increasing order :

## Revision of Fractions on the Unit Square

|  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

The square with the darker border is the unit whole. Color and show the following fractions. Use a different unit space above to show each fraction.

$$
\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}
$$

Colour and show the fraction

$\frac{3}{16}$

$\frac{3}{8}$

$\frac{3}{4}$

|  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

$\frac{3}{2}$

## Decimal Fractions on a Number Line

(This unit length is 10 cm . Measure it with your scale. Use a scale for doing the other problems also.)


Show and write the following fractions on the above number line :

$$
\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{9}{10}, \frac{10}{10}, \frac{11}{10} \frac{15}{10}, \frac{16}{10},
$$



Show and write the positions of the following fractions by putting points on the above number line :

$$
\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}
$$

Repeat for the number line shown below :


Show the positions of the following fractions by putting points on the above number line :
$\frac{1}{10}, \frac{1}{100}, \frac{2}{100}, \frac{3}{100}, \frac{10}{100}, \frac{11}{100}, \frac{20}{100}, \frac{50}{100}, \frac{51}{100}, \frac{99}{100}, \frac{100}{100}, \frac{101}{100}, \frac{110}{100}$

## Revision of Place Value

UNITS

$3 \times 1$

| TH | $H$ | T | $U$ |
| :---: | :---: | :---: | :---: |
| 1 | 2 | 4 | 3 |

$$
1 \times 1000+2 \times 100+4 \times 10+3 \times 1
$$

INTRODUCING THE HOUSE OF $\frac{1}{10}$
Divide
 into ten parts. We get

$$
\square=1=10 \times \frac{1}{10}
$$

House of $\frac{1}{10}$

10

$3 \times 10$



$\square \times 1$

TENS

$4 \times 10$

Place Value


## Writing expanded form into short form

| $3 \times 100+2 \times 10+4 \times 1$ |  | $\square$ |
| :--- | :--- | :--- |
| $3 \times 100+2 \times 10+4 \times 1+6 \times \frac{1}{10}$ |  | $\square$ |
| $2 \times 10+5 \times 1+5 \times \frac{1}{10}$ |  | $\square$ |
| $3 \times 100+0 \times 10+5 \times 1$ |  | $\square$ |
| $3 \times 100+0 \times 10+5 \times 1+6 \times \frac{1}{10}$ |  | $\square$ |
| $5 \times 100+2 \times 10+0 \times 1+3 \times \frac{1}{10}$ |  | $\square$ |

Writing short form as expanded form

```
324 }\longrightarrow3\times100+2\times10+4\times
324.6 3 < 100 + 2 x 10 + 1\times4 + 6 x \frac{1}{10}
400.5 \longrightarrow
21.6
```

$\qquad$

```
1.5
```



```
0.5
```



```
11.5
```



```
205.6
```



```
250.6
```

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## INTRODUCING THE HOUSE OF $\frac{1}{100}$

$\square$ is $\frac{1}{10}$
Divide it into 10 equal parts.
$\square=||||||||| |$

Each part is ।. Each part is $\frac{1}{100}$

10

$3 \times 10$

1

$2 \times 1$

$$
\frac{1}{10}
$$


$4 \times \frac{1}{10}$

$5 \times \frac{1}{100}$

We write it in houses as

| $T$ | $U$ | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: |
| 3 | 2 | 4 | 5 |

We can write it in decimal form as $\quad 32.45$
Write in decimal form

Houses
Decimal Form

| $H$ | $T$ | $U$ | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 3 | 4 | 5 | 2 | 5 |


| $H$ | T | U | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 2 | 0 | 3 | 2 | 0 |


| $H$ | T | U | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
|  | 6 | 9 | 0 | 9 |

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## Houses

Decimal Form

| TH | $H$ | T | U | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 6 | 7 | 0 | 0 | 2 | 5 |


| $H$ | $T$ | $U$ | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 0 | 0 | 0 | 3 | 5 |



| $H$ | $T$ | $U$ | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 5 | 6 | 0 | 0 |



| 100 | 10 | 1 | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 3 | 4 | 5 | 2 | 5 |



| 100 | 10 | 1 | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 0 | 2 | 5 | 0 | 5 |



| 100 | 10 | 1 | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: | :---: | :---: |
| 3 | 5 | 5 | 6 | 6 |



## Visual Decimals

Write the value of coloured fraction in decimal form if the big square is one whole.

$\frac{1}{100}, 0.01$

$\frac{10}{100}, \frac{1}{10}, 0.1,0.10$

$\frac{25}{100}, 0.25$

Write in decimal form





## Represent Visually by Shading


0.07

0.60

0.17

0.77

1.09
1.99

2.56

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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## Addition of Decimals

$0.5+0.3=5 \times \frac{1}{10}+3 \times \frac{1}{10}=8 \times \frac{1}{10}=0.8$

| $U$ | $\frac{1}{10}$ |
| :---: | :---: |
| 0 | 5 |
| $+\quad 0$ | 3 |
| 0 | 8 |

$0.4+0.3=\square \times \frac{1}{10}+\square \times \frac{1}{10}=\square \times \frac{1}{10}=\square$

| $U$ | $\frac{1}{10}$ |
| ---: | :---: |
| 0 | 4 |
| $+\quad 0$ | 3 |
|  |  |


| $U$ | $\frac{1}{10}$ |
| :---: | :---: |
| 0 | 3 |
| $+\quad 0$ | 6 |
|  |  |


| $U$ | $\frac{1}{10}$ |
| :---: | :---: |
| 0 | 4 |
| $+\quad 0$ | 4 |
|  |  |



| $U$ | $\frac{1}{10}$ |
| ---: | :---: |
| 2 | 2 |
| $+\quad 9$ | 3 |
|  |  |


| $U$ | 1 |
| :---: | :---: |
| $T$ |  |
| 0 | 6 |
| +0 | 7 |
| 0 | 13 |
| 1 | 3 |

$0.7+0.8=$


## Addition of Decimals with carry

Worked Examples

| H | T | U |
| :---: | :---: | :---: |
| 2 | 7 | 8 |
| $+\quad 3$ | 1 | 7 |
| 5 | 8 | 15 |
| 5 | 9 | 5 |

$278+317$
Ans: 595

| T | U | $\frac{1}{10}$ |
| :---: | :---: | :---: |
| 2 | 7 | 8 |
| $+\quad 3$ | 1 | 7 |
| 5 | 8 | 15 |
| 5 | 9 | 5 |

$27.8+31.7$
Ans: 59.5

| $U$ | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: |
| 2 | 7 | 8 |
| $+\quad 3$ | 1 | 7 |
| 5 | 8 | 15 |
| 5 | 9 | 5 |

$2.78+3.17$
Ans: 5.95
$15.6+6.8$
$0.15+2.1$
$2.78+3.56$


Ans:


Ans:


Ans:


Ans:


Ans:
$0.99+0.99$


Ans:

## Subtraction of Decimals

Worked Examples


Ans: 9.3


Ans: 1.5


Ans:

4-2.55

| 1 | $\frac{1}{10}$ | $\frac{1}{100}$ |
| :---: | :---: | :---: |
| $3_{A}$ | ${ }^{9} \varnothing$ | ${ }^{10} \varnothing$ |
| 2 | 5 | 5 |
| 1 | 4 | 5 |

Ans: 1.45

23-1.11


Ans:

## Organization of Data

There are 30 students in class VI. In school gathering 10 students participated in dance, 7 students in drama, 4 students in song and 2 students in debate. Each student participated only in one activity. Represent the above information in tabular form.

| Event | Number of students participated |
| :---: | :--- |
| Dance |  |
| Drama |  |
| Song |  |
| Debate |  |

$\ddot{\mathbf{Y}}$ How many $\mathrm{VI}^{\text {th }}$ standard students participated in drama?

$\ddot{\mathrm{Y}}$ How many $\mathrm{VI}^{\text {th }}$ standard students participated in dance?

$\ddot{\mathrm{Y}}$ How many $\mathrm{VI}^{\text {th }}$ standard students participated in gathering?
$\ddot{\text { Y}} \mathrm{How}$ many $\mathrm{VI}^{\text {th }}$ standard students did not participate in gathering?


Marks obtained by 30 students in mental mathematics examination were as follows. Arrange these marks in a table using tally marks.
$8,9,8,10,7,6,10,8,6,7,9,9,8,7,5,7,8,6,5,6,5,7,9,10,10,7,9,8,7,7$

| Marks | Tally Marks | Number of students |
| :---: | :---: | :---: |
| 5 | III | 3 |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |

ŸHow many students obtained 10 marks?

ŸHow many students obtained marks below 7 ?


ŸHow many students obtained marks equal to or more than 7 ?


## Pictograph

Read the pictograph below and give the following information.


Agroup of friends made a pictograph of the number of fishes each one caught on a holiday.


Who caught highest number of fishes and how many? $\square$
How many fishes did Minu catch?


How many fishes did they catch altogether?


The following pictograph shows different modes of transport and the numbers of students using them.

| Mode of travelling | Number of students 10 students) |
| :---: | :---: |
| Walking |  |
| Public bus | $\because \ominus$ |
| Cycle |  |
| Auto Rikshaw |  |
| Private Car | "-"' |

The number of students coming by public bus is


How many students use a cycle?


Which mode is used the most? Cycle / Walking / Auto Rickshaw.

The number of students coming by private car is


Thenumbertudent coming bypivater


## Drawing Pictographs

In a grocery store there were the following food item bags. Draw a pictograph from the information.

| Food Item | Bags |
| :---: | :---: |
| Rice | 50 |
| Wheat | 35 |
| Toor Dal | 10 |
| Masoor Dal | 5 |


| Food Item | Bags <br> 5 bags |
| :---: | :---: |
| Rice |  |
| Wheat |  |
| Toor Dal |  |
| Masoor Dal |  |

The available stock of books in the library cupboard of class VI is given in the table pictograph.

| Subject | Number of <br> Books |
| :---: | :---: |
| Science | 32 |
| Sports | 8 |
| Poem | 16 |
| Story | 40 |
| History | 24 |


| Subject | Number of books <br> 1 Picture $=\ldots$ books |
| :---: | :---: |
| Science |  |
| Sports |  |
| Poem |  |
| Story |  |
| History |  |

## Reading bar graphs

$\ddot{\mathbf{Y}}$ Read the bar graph and answer the questions.

$\ddot{\mathbf{Y}}$ Scale of the graph is: 1 unit length $=1$ run
$\ddot{\mathbf{Y}}$ Number of runs scored by Virat per over:

| Over | Runs |
| :---: | :---: |
| 1 | 6 |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

$\ddot{\mathbf{Y}}$ Highest score in an over: $\square$ runs.
$\ddot{\mathbf{Y}}$ In which over did Virat score the highest runs? $\square$
$\ddot{\mathbf{Y}}$ Minimum score in an over: $\square$ runs.
$\ddot{\mathbf{Y}}$ Total score in 5 overs: $\square$ runs.
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Mark the points according to the given scale and plot the bar graphs of following data.

| Favourite colour | Red | Blue | Green | Orange |
| :--- | :---: | :---: | :---: | :---: |
| Number of students | 100 | 80 | 60 | 20 |



Monthly reading progress of Dinesh :


Scale of the graph is
1 unit length = $\square$ books
$\ddot{\mathbf{Y}}$ What is shown on horizontal axis (xaxis)? $\qquad$ .
$\ddot{\mathbf{Y}}$
$\ddot{\mathbf{Y}}$ What is shown in vertical axis (y axis)? $\qquad$ .
$\ddot{Y}$
$\ddot{\mathbf{Y}}$ How many books did Dinesh read in the month of July? $\square$
$\ddot{\mathbf{Y}}$
$\ddot{\mathbf{Y}}$ How many books did Dinesh read in the month of September? $\square$

If you walk along the border of each of these figures how much distance would you walk?

If you shade the small squares inside each of these figures how many squares would you shade?

$\square$ Distance walked $=\square \mathrm{cm}$ Squares shaded $=\square \mathrm{cm}^{2}$ Squares shaded $=\square \mathrm{cm}^{2}$


Distance walked around the borders $=$ Sum of all sides $=$ Perimeter

## Number of full squares shaded inside the rectangle $=$ Area

Count the squares and find the area of each figure.


Find the perimeter of the following rectangles.

| Length of <br> rectangle | Breadth of <br> rectangle | Perimeter by <br> adding all sides | Perimeter by <br> $2 \times$ (length + <br> breadth) |
| :---: | :---: | :---: | :---: |
| 10 cm | 5 cm | $=10 \mathrm{~cm}+5 \mathrm{~cm}+$ <br> $10 \mathrm{~cm}+5 \mathrm{~cm}$ <br> $=30 \mathrm{~cm}$ | $=2(10 \mathrm{~cm}+5 \mathrm{~cm})$ <br> $=2 \times 15 \mathrm{~cm}$ <br> $=30 \mathrm{~cm}$ |
| 10.5 cm | 3.5 cm |  |  |
| 28 cm | 12 cm |  |  |
| 0.5 m | 0.25 m |  |  |

Find the perimeter of the following squares.

| Length of side <br> of square | Perimeter by <br> adding all sides | Perimeter by <br> $4 \times$ length of a side |
| :---: | :--- | :--- |
| 15 mm | $=15 \mathrm{~mm}+15 \mathrm{~mm}+$ <br> $15 \mathrm{~mm}+15 \mathrm{~mm}$ <br> $=60 \mathrm{~mm}$ | $=4 \times(15 \mathrm{~mm})$ <br> $=60 \mathrm{~mm}$ |
| 12 cm |  |  |
| 1.8 m |  |  |
| 5 m |  |  |

Find area and perimeter.


Perimeter $=\ldots \mathrm{cm}$
Area $=$ $\qquad$ $\mathrm{cm}^{2}$


$$
\begin{aligned}
& \text { Perimeter }=\ldots \mathrm{cm} \\
& \text { Area }=\ldots \mathrm{cm}^{2}
\end{aligned}
$$

## Perimeter of rectangle $=\mathbf{2} \times$ (length + breadth $)$

Area of rectangle $=$ Length $\times$ Breadth
Use the formula and fill in the table.

| Length (cm) | Breadth (cm) | Area $\left(\mathrm{cm}^{2}\right)$ | Perimeter(cm) |
| :---: | :---: | :---: | :---: |
| 6 | 3 |  |  |
| 10 | 3 | 25 |  |
| 5 |  | 50 |  |
| 5 |  | 40 |  |
| 10 |  | 100 |  |
| 10 |  |  |  |
| a Navnirmiti Learning Foundation |  |  |  |

Find the perimeter (Distance walked around the border) :


Perimeter $=\square \mathrm{cm}$


Perimeter $=\square$
cm


Perimeter $=\square \mathrm{cm}$


4 cm
Perimeter $=\square$
cm

$$
\text { Perimeter }=\square \mathrm{cm}
$$




Perimeter $=\square \mathrm{cm}$

Each square in the grid is $1 \times 1$ square centimeter. Mark the missing side length and calculate the perimeter.


## Word Problems

1) The blackboard in the classroom measures 1.2 m by 1 m . What is the perimeter of the blackboard.
2) Find the cost of fencing a park square in shape of side 250 m at the rate of Rs .20 per meter.
3) Two sides of a triangle are 12 cm and 14 cm . The perimeter of the triangle is 36 cm . What is the length of the third side?
4) Swara runs around a square park of side 75 m . Bulbul runs around a rectangular park with length 60 m and breadth 45 m . Who covers more distance?
5) Find the perimeter of a regular hexagon with each side measuring 10.2 cm .

## What is an expression with ' n '

1) Make a line of cubes

1 cube :

$1 \times 1$ (1 taken 1 time)

2 cubes :

$1 \times 2$
(1 taken 2 times)

3 cubes :

$1 \times 3$
$1 \times 6$
6 cubes :

$1 \times \mathrm{n}$ (1 taken n times)
n cubes :

2) Make a rectangle with groups of 2 cubes -

Write it as a multiplication

| 1 group |
| :--- |
| of 2 |$\quad \square$

$2 \times 1$ two taken one time
2 groups
of 2

$2 \times 2$ two taken two times
3 groups
of 2

$\begin{aligned} 2 \times 3 & \text { two taken } \\ & \text { three times }\end{aligned}$
5 groups
of 2

$2 \times 5$ two taken five times
n groups
of 2

$2 x$

two taken n times

Make a rectangle with groups of 3 cubes -
Write the multiplication


Find the rule which gives the numbers of matchsticks required to make a pattern of letter T

2


$2 \times \mathrm{n}$

Find the rule to make a pattern of


$$
3 \times n
$$

Find the rule to make a pattern of



Find the rule to make a pattern of


Find the rule to make a pattern of


Find the rule to make a pattern of


## Writing the rule :

Cadets are marching in a parade. There are 5 cadets in a row. What is the rule which gives the number of cadets, given the number of rows? (Use n for the number of rows.)

The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Use s for the number of students.)

Leela is Radha's younger sister. Leela is 4 years younger than Radha. Can you write Leela's age in terms of Radha's age? (Take Radha's age to be x.)

Mother has made laddoos. She gives some laddoos to guests. 5 laddoos remain. If the number of laddoos mother gave away is $p$, how many laddoos did she make?

Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and 10 oranges remain outside. If the number of oranges in a small box are taken to be $x$, what is the number of oranges in the larger box?

Look at the following matchstick pattern of triangles. Find the general rule that gives the number of matchsticks in terms of the number of triangles.

|  | 2 |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| No. of <br> Triangles | 1 |  |  |  |
| No. of <br> matchsticks | 3 |  |  |  |

Rule : $\square$

Look at the following matchstick pattern of squares. Find the general rule that gives the number of matchsticks in terms of the number of squares.

|  |  | 2 |  |  |
| :--- | :---: | :---: | :---: | :---: |
| No. of <br> Squares | 1 | 2 |  |  |
| No. of <br> matchsticks | 4 |  |  |  |

Rule :


Rules for geometry

The side of a regular hexagon is $l$. Express the perimeter of the hexagon using $l$.

Perimeter $=$ $\qquad$

$A B$ is the diameter of the circle with center C. Express the diameter (d) in terms of its radius (r).
$\mathrm{d}=$ $\qquad$


Express the perimeter and area of the rectangle in terms of its length (I) and breadth (b)

Perimeter $=$ $\qquad$

$$
\text { Area }=
$$

$\qquad$


Express the perimeter of the given triangle in terms of its sides $a, b$ and $c$.

Perimeter $=$ $\qquad$


## Expressions with variables.

Give expressions :


Take Sarita's present age to be y years.

1) What will be her age 5 years from now?

2) What was her age three years back ?

3) Sarita's grandfather is 6 times her age.

What is the age of her grandfather ?

4) Grandmother is 2 years younger than grandfather. What is grandmother's age?

4) Sarita's friend is 2 years older than Sarita.


| Statement using expressions | Statement in ordinary language |
| :--- | :--- |
|  |  |
| Salim scores r runs and <br> Nalin scores (r + 15) runs. | Nalin scores 15 runs more <br> than Salim. |
| A notebook costs Rs.p. <br> A book costs Rs.3p |  |

## Simple Equations

1) 


2)


Write the same number in each triangle :
eg.


$$
3+3+3+3=\Delta+\Delta+\Delta
$$


$\qquad$

$\Delta=$
$\qquad$

$$
\Lambda+\Lambda+\Lambda+\Lambda=9+\Lambda=
$$

$$
\Delta=
$$

$\qquad$


$$
\Delta=
$$

$\qquad$
$2 \times \leadsto+2=10$

$$
\triangle=
$$

$\qquad$

$$
5-\Lambda=2
$$

$$
\Lambda=
$$

$\qquad$

$$
6-\Lambda=\widehat{\Delta}+\Lambda
$$

$$
\lambda=\ldots \ldots \ldots \ldots \ldots \ldots
$$

## Simple Equations

$$
\begin{aligned}
& \wedge+3=7 \\
& x+3=7
\end{aligned}
$$

$$
x=
$$

$\qquad$
$\Lambda+\lambda+3=9$

$$
x+x+3=9, \quad x=
$$

$2 \widehat{\$}+1=9$
$2 x+1=9$,
$x=$
$5 \wedge=20$
$5 x=20, \quad x=$ $\qquad$
$4 x=12$,

$$
x=
$$

$3 x=12$,
$x=$ $\qquad$

$$
3 x+1=13
$$

$$
x=
$$

$\qquad$

$$
3 x+3=15
$$

$$
x=
$$

$\Delta-3=4$

$$
x-3=4
$$

$$
x=
$$

$2 \wedge-4=2$
$2 x-4=2$,
$x=$

$$
\begin{aligned}
& 10-\bigwedge=6 \\
& 10-x=6,
\end{aligned}
$$

$$
x=
$$

$12-2 x \bigwedge=4$
$12-2 x=4$,

$$
x=
$$

$2 x-1=5$,

$$
x=
$$

$3 x-1=5$,

$$
x=
$$

$10 x=40$,

$$
x=
$$

$\qquad$
$10 x-1=9$,

$$
x=
$$

$$
x+3=5,
$$

$$
X=
$$

$\qquad$


$$
x=
$$

$$
x+x+x=3+3+3+3,
$$

$$
X=
$$

$$
x+x+3=10
$$

$$
X=
$$

$\qquad$

$$
2 x+3=10,
$$

$$
x=
$$

$\qquad$

```
    x + x + x + x = x + 9,
```

$$
x=
$$

$$
4 x=x+9,
$$

$$
x=
$$

$\qquad$

1) $x+x+x=x+x+5, \quad x=?$
2) $3 x=2 x+5, \quad x=$ ?
3) $x+x+x=15, \quad x=$ ?
4) $3 x=15$,
$x=$ ?
5) $2 x+2=10$,
$x=$ ?

## Ratios

1) Isha's weight is 25 kg and her father's weight is 75 kg . Find the ratio of father's weight to Isha's weight?

Ratio of father's weight to Isha's weight $=\frac{75}{25}$

$$
=\frac{3}{1} \quad=3: 1
$$

Ratio of Isha's weight to Father's weight $=\frac{25}{75}$

$$
=\frac{1}{3}=1: 3
$$

2) In a class, there are 20 boys and 40 girls.
a) Ratio of number of girls to total number of students.

b) Ratio of number of boys to total number of students.

c) Ratio of number of boys to total number of girls.

3) Find the ratio of length to breadth of a rectangular field having length as 50 m and breadth as 15 m .
4) Find the ratio of 81 to 108 .
5) Find the ratio of 30 minutes to 45 minutes.
6) There are 4 teachers and 100 students. Find the ratio of number of teachers to number of students.
7) Divide 20 pens in the ratio $3: 2$ between Karan and Kalika.

The two parts are 3 and 2
Sum of parts is $3+2=$
5

If there are 5 pens, Karan will get 3 pens and Kalika will get 2 pens.
Karan gets $\frac{3}{5}$ and Kalika gets $\frac{2}{5}$ of 20 pens.
Karan gets $\frac{3}{5} \times 20=12$ pens.
Kalika gets $\frac{2}{5} \times 20=8$ pens
8) Divide Rs. 60 in the ratio $1: 2$
8) Divide Rs. 60 in the ratio $2: 10$

Equivalent ratios are like equivalent fractions.


$$
\frac{15}{18}=\frac{\square}{\square}=\frac{\square}{\square}=\frac{\square}{\square 30}
$$

$\frac{2}{3}=\frac{4}{6}$
$2: 3=4: 6$
2: 3 :: $4: 6$
$2,3,4$ and 6 are in proportion.

$4: \square=\square: 15$
$\square \square \square$ are in proportion.

1535 are in proportion.

16618 are in proportion.

## $155 \square 100$ are in proportion.



Are the following in proportion?

1) $15,45,40,120$
2) $8,9,24,25$
3) $125,25,300,60$

## Practical Geometry

Draw a circle of radius 3 cm .

Draw a perpendicular to segment $A B$ through point $M$ :
. M
A
B
M

Draw a line segment of length 10.3 cm . Draw its perpendicular bisector using ruler and compass.

Draw an angle of measure 65 degrees and bisect it using ruler and compass.


