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1 Addition and Subtraction

Keynotes

1. Smallest whole number is 0.

2. The rightmost digit of a number is in the ones place. From the ones place, the digit on its left are the tens place, hundreds place, and so on.
For example, the ones place, tens place and hundreds place digit of the number 358 are 8, 5 and 3 respectively.

3. Addition and subtraction are rearrangeable for as long as the sign follows the number.
For example,
$2 - 4 + 5$
$= 2 + 5 - 4$
$= 7 - 4$
$= 3$

4. To split and regroup numbers. During addition, we may 'remove' the digits in the ones place and add the numbers. Then, add the digits in the ones place to the sum.
For example,
$7 + 12 + 25 + 38$
$= 7 + 10 + 2 + 20 + 5 + 30 + 8$
$= 10 + 20 + 30 + 7 + 2 + 5 + 8$

Example 2:

Find the value of each of the following.

(a) 85 – 43

(b) 721 – 108

Solution:

(a) 85 – 43

= 85 – 40 – 3

= 45 – 3

= 42

(b) 721 – 108

= 711 + 10 – 100 – 8

= 611 + 2

= 613

Example 3:

What is the sum of 997, 98 and 9?

Solution:

Each of the numbers are close to 1000, 100 and 10, so we write

997 as 1000 – 3, 98 as 100 – 2 and 9 as 10 – 1

Then 997 + 98 + 9

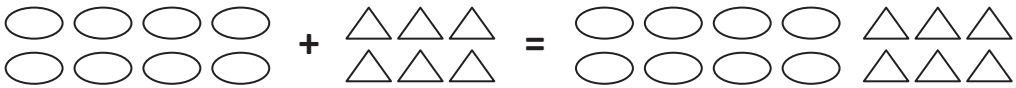
= 1000 – 3 + 100 – 2 + 10 – 1

= 1110 – 6

= 1104

3. We group numbers that are common under addition and subtraction. This is called factorization.

For addition.



$2\times4+2\times3$
$=8+6$
$=14.$

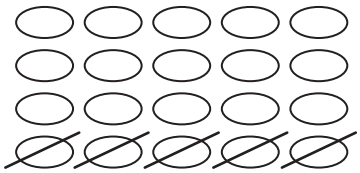
$2\times(4+3)$
$=2\times7$
$=14.$

or

$(4+3)\times2$
$=7\times2$
$=14.$

So, $2\times4+2\times3=2\times(4+3)$ or $2\times4+2\times3=(4+3)\times2$.

For subtraction.



$4\times5-1\times5=(4-1)\times5$.

4. Multiplication involving multiples of tens is easier to calculate. For examples,

$1\times10=10$
$2\times5=10$ *(Another way to obtain 10 from product of 2 whole numbers.)*
$3\times10=30$, *(Adding a digit 0 to 3.)*
$40\times70=2800$, *(Multiple non-zero digits and add total number of zeros.)*
$50\times300=15000$. *(Multiple non-zero digits and add total number of zeros.)*

5. When a product of numbers consists of numbers close to multiple of tens, it will be easier to express the numbers as a sum or subtraction of tens and ones.

Example 5:

Fill in the correct answer for each blank below.

(a) $9 \times (\quad\quad) = 2898$

(b) $1498 \div (\quad\quad) = 7$

(c) $(\quad\quad) \times 4 = 8112$

(d) $3 \times (\quad\quad) = 5871$

Solution:

(a) Since 9 times of ( ) is 2898, we calculate $2898 \div 9$.

$$9\overline{)2\ 8\ {}^{1}9\ {}^{1}8} \quad \begin{matrix} & 3 & 2 & 2 \end{matrix}$$

So $9 \times (322) = 2898$.

(b) $1498 \div (\quad\quad) = 7$ is the same as working out $1498 \div 7$.

$$7\overline{)1\ 4\ 9\ {}^{2}8} \quad \begin{matrix} & 2 & 1 & 4 \end{matrix}$$

So $1498 \div (214) = 7$.

(c) $(\quad\quad) \times 4 = 8112$ is the same as working out $8112 \div 4$.

$$4\overline{)8\ 1\ {}^{1}1\ {}^{3}2} \quad \begin{matrix} & 2 & 0 & 2 & 8 \end{matrix}$$

So $(2028) \times 4 = 8112$.