BASIC MATHEMATHICS MATH 0101

BASIC ARITHMETIC PROCEDURES AND DECIMAL FRACTIONS

The ‘Four Rules’

There are four basic processes in arithmetic.

- **Addition** – is the putting together of different individual quantities to make a single larger quantity.
- **Subtraction** – is the taking away of one quantity from another, thus making it smaller.
- **Multiplication** – is a process, which performs repeated additions very quickly.
- **Division** – is a process, which performs repeated subtractions very quickly.

Our number system is based on **number 10**: it is called the **decimal system** (decem = Latin, ten).

Addition of Number

Example

		A	B	C	D
		1	8	7	6
			5	9	5
		2	0	6	4
+		7	1	3	6
	1	1	6	7	1
		1	2	2	

Adding up sums like this is called *long-totting*, a word which come from ‘totaling’. Always start with the units column. It is a good idea to write in the ‘carrying’ figures, those, which are to be carried into the next column.

Subtraction

- Frequently in business we have to subtract or take away one quantity from another.
- For example:
  - *stock that is sold* is subtracted from ‘stock available’ to give ‘stock in hand’
  - ‘*net profit*’ is calculated by subtracting ‘expenses’ from ‘gross profit’.

Multiplication

- Multiplication is a shortened version of addition.
- Multiplications always include the word times, indicated by the multiply sign x
- for example, 2 x 3 is read ‘two times three’.
- A simple multiplication uses the individual parts of the multiplication tables, or multiplication bonds.
- Eg: 1273 x 7 = ??

Try!

1) At a book exhibition *156 visitors bought 3 books* each, *272 bought 4 books* each and *105 bought 5 books* each. *826 visitors bought 2* books and *1275 visitors each bought only one book*. No visitor bought more than 5 books. **How many books were sold altogether?**

2) In a survey of milk yield *365 cows gave 25 litres* each per day, *482 gave 21 litres* per day and *587 gave 16 litres* per day. **What was the total daily milk yield?**

3) A library discovers that the following issues were made: *2 785 books were issued once* in the month, *7 295 were issued twice* in the month, *11 565 were issued three times* in the month and *854 were issued four times*. No book was issued more than four times in a month. **What was the total number of issues made in the month?**

Division

- Division is a shortened version of subtraction.
- If we want to know how many 2s there are in 10 we can subtract 2 from 10 (which would leave 8), and so on.
- Eventually we would find that there were five 2s in 10.

Try!

1. The Working Men's Club collects a 'mountain of coins' on its counter for the local orphanage. *There prove to be 11729 coins in the pile, to share among 37 children*. **How many coins does each child receive?**

2. Because of shortage of sugar, a grocer decides *to divide his supplies equally between his 125 regular customers*. In a month he receives 2825 bags of sugar. Any remainder after sharing the bags will be sold to casual customers, a single bag to each. How many casual customers can be supply?

The Decimal System

a unit is divided into ten parts	one-tenth
a unit is divided into a hundred parts	one-hundredth.
a unit is divided into a thousand parts	One-thousandth

the letters ‘th’ added at the end of a word indicating a part smaller than a unit.

Addition and Subtraction of Decimals

- always keep the decimal points underneath one another.
- Eg:
- Add up the following numbers: 1.16, 2.75, 3.08, 4.057

Try!

1. Work out each of the following addition sums:

   a) 27.75 + 14.47 + 18.69 + 24.21 =
   b) 42.35 + 32.38 + 37.28 + 42.48 =
   c) 94.85 + 68.52 + 40.52 + 74.37 =
   d) 136.72 + 1.45 + 19.834 + 4.059 =
   e) 716.35 + 27.56 + 847.25 + 827.5 =

2. Find the remainder in each of the following subtractions:

   a) 49.67 – 29.37 =
   b) 31.63 – 14.95 =
   c) 29.459 – 3.687 =
   d) 426.32 – 28.85 =
   e) 417.242 – 28.729 =

Multiplication of Decimals

- Ignore the decimal points altogether until the end of the multiplication
- then -> determine the correct position of the decimal point in the result.

- Eg, 1.72 multiply by 1.5

Try!

1) Carry out the following multiplications, taking care to place the decimal point correctly in each answer:
   a) 7.56 x 1.5 =
   b) 9.75 x 2.3 =
   c) 27.3 x 3.8 =
   d) 8.46 x 1.8 =
   e) 7.116 x 27.2 =
   f) 24.65 x 0.850 =

Multiplying and Dividing Decimals by Multiples of 10

- decimal system is a system of tens => simply by changing its place value.
- **multiply** by 10, 100, 1000 or any other multiple of ten by moving the decimal to the *right*.
- **divide** by 10, 100 and so on, by moving decimal to the *left*.

Example:

227.954	**Multiplication**	**Division**
By 10		
By 100		
By 1000		

Try!

a) 27.65 x 10 =
b) 49.725 x 100 =
c) 7 256.1 x 100 =
d) 386.56 x 1 000 =
e) 47.65 ÷ 10 =
f) 275.84 ÷ 100 =
g) 4 725.636 ÷ 10 000 =
h) 4.95 ÷ 10 =

Division by Decimals

- alter the ***divisor*** so that it becomes a **whole number**.

<u>Example:</u> 4.5 ÷ 1.5

- **remove the decimal point** is to multiply by 10,
  thus 10 x 1.5 = 15.

- 4.5 clearly must multiply the 4.5 by 10 as well.

Example:

Divide 142.725 by 7.5

$$142.725 \div 7.5$$

Change the divisor to a whole number: 75

Now to do this we multiplied 7.5 by 10, so we must now multiply the dividend, 142.725, by 10. we now write the division as

$$1\,427.25 \div 75 = 19.03$$

Try!

1. Carry out the following divisions (no remainders are involved):
   a) 2.6 ÷ 1.3 =
   b) 3.52 ÷ 1.6 =
   c) 244.4 ÷ 4.7 =

2. Carry out the following divisions:
   a) 121.77 ÷ 2.7 =
   b) 45.22 ÷ 3.8 =
   c) 445.5 ÷ 16.5 =

Divisions Which Do Not Come Out Exactly

- For example:

  100 ÷ 3 = 33.333333 etc

  100 ÷ 9 = 11.111111 etc

  known as a *recurring decimal*

  These numbers are read as '*thirty-three point three recurring*' and '*eleven point one recurring*' (33.3 or 11.1).

- Example:

  287 ÷ 19 = 15.10526315

Two decimal places = 15.11

Three decimal places = 15.105

Four decimal places = 15.1053

Five decimal places = 15.10536