



**LEVEL 4 MATHEMATICS
REVISION OF NUMBER**

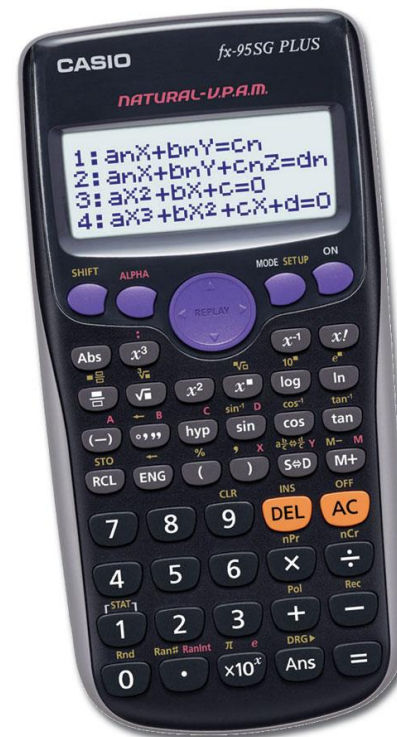


Numbers in everyday life

- Paying bills
- Shopping
- Selling
- Cooking
- Travelling
- Measuring
- Sport
- Time
- Building
- Music
- Patterns
- Budgeting
- Medication
- Salaries
- Benefits
- Science
- Statistics
- Computers

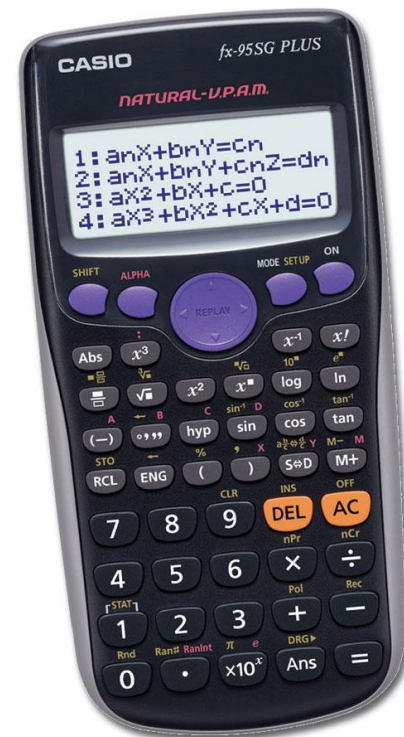
Resetting your Calculator

- Shift 9
- Choose 3 (All)
- Choose = (Yes)
- Choose AC (Reset all)



Setting up your Calculator for Assignment 1

- Shift
- Mode set-up
- Press 2 (Linear)





Converting currencies

- To change **Irish money to foreign money** - **multiply** by the exchange rate.
- To change **foreign money to euro** - **divide** by the exchange rate.

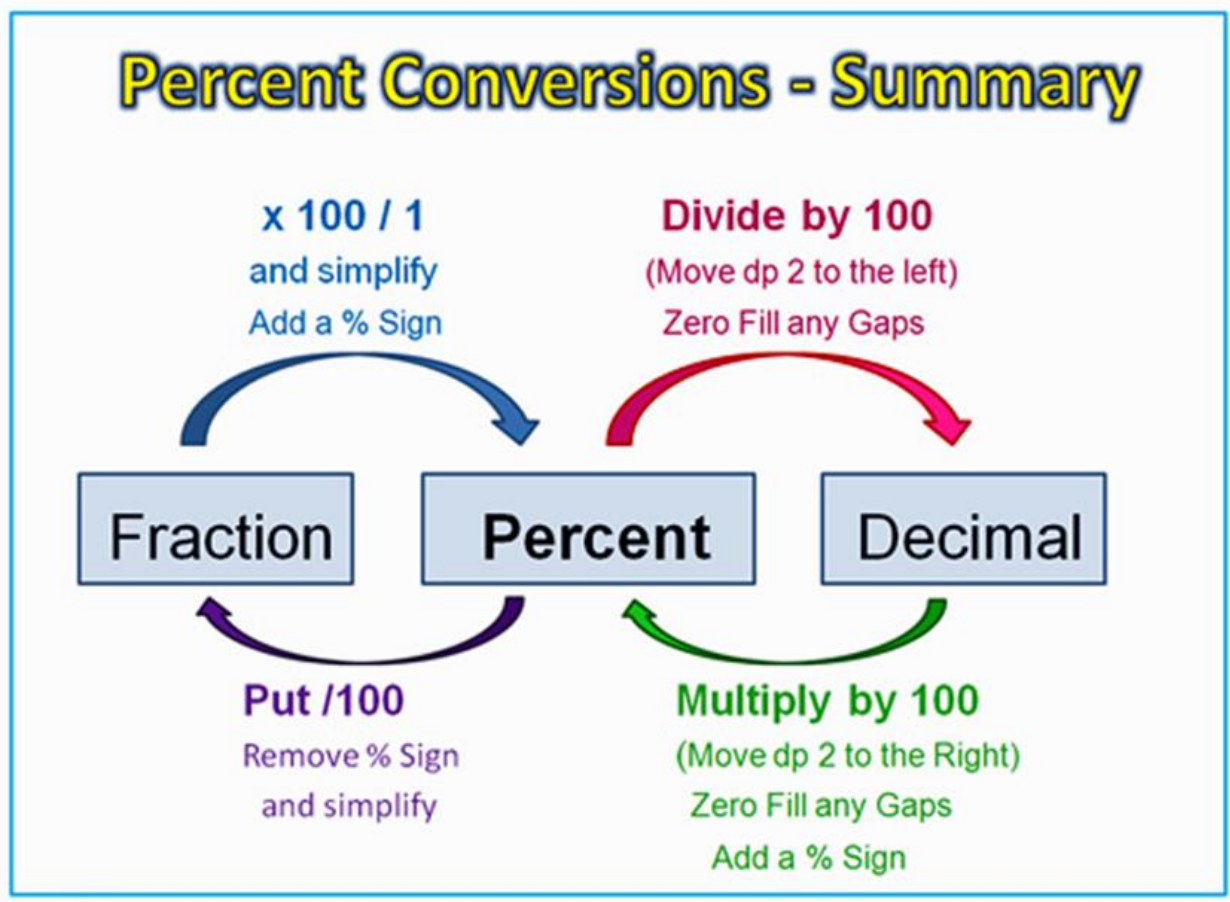
$$\text{E.g. } 1.00 \text{ EUR} = 1.29573 \text{ USD}$$

$$€45 = 1.29573 \times 45 = \$58.31$$

$$\$45 = 45 \div 1.29573 = €34.73$$



Converting fractions, decimals, %





Converting fractions, decimals, %

- Examples:

Fraction	Decimal	Percentage
	Divide top number (numerator) by bottom number (denominator)	X 100
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{3}{4}$	0.75	75%



Ratios

- If there are 4 men and 8 women (lucky men!), the ratio will be:

4: 8

- This can be simplified as 4 will divide into each:

1: 2



Conversions...

- Example:

Fraction	Decimal	Percent (%)	Ratio
$\frac{1}{4}$	0.25	25	1 : 4
$\frac{3}{8}$	0.375	37.5	3 : 8
$\frac{5}{6}$	0.83 $\bar{3}$	83. $\bar{3}$	5 : 6




Standard form to scientific notation

51,300
 5.13×10^4

Write this number using scientific notation.
Use 'x' for multiplication.

5.13 x 10⁴



Scientific notation on your calculator

To convert from standard form to scientific notation on your calculator:

- Shift
- Mode Set-up
- Choose 7 (scientific)

***Don't forget to reset your calculator when you are done!!!!**



Scientific notation to standard form

Positive Power = Large Number

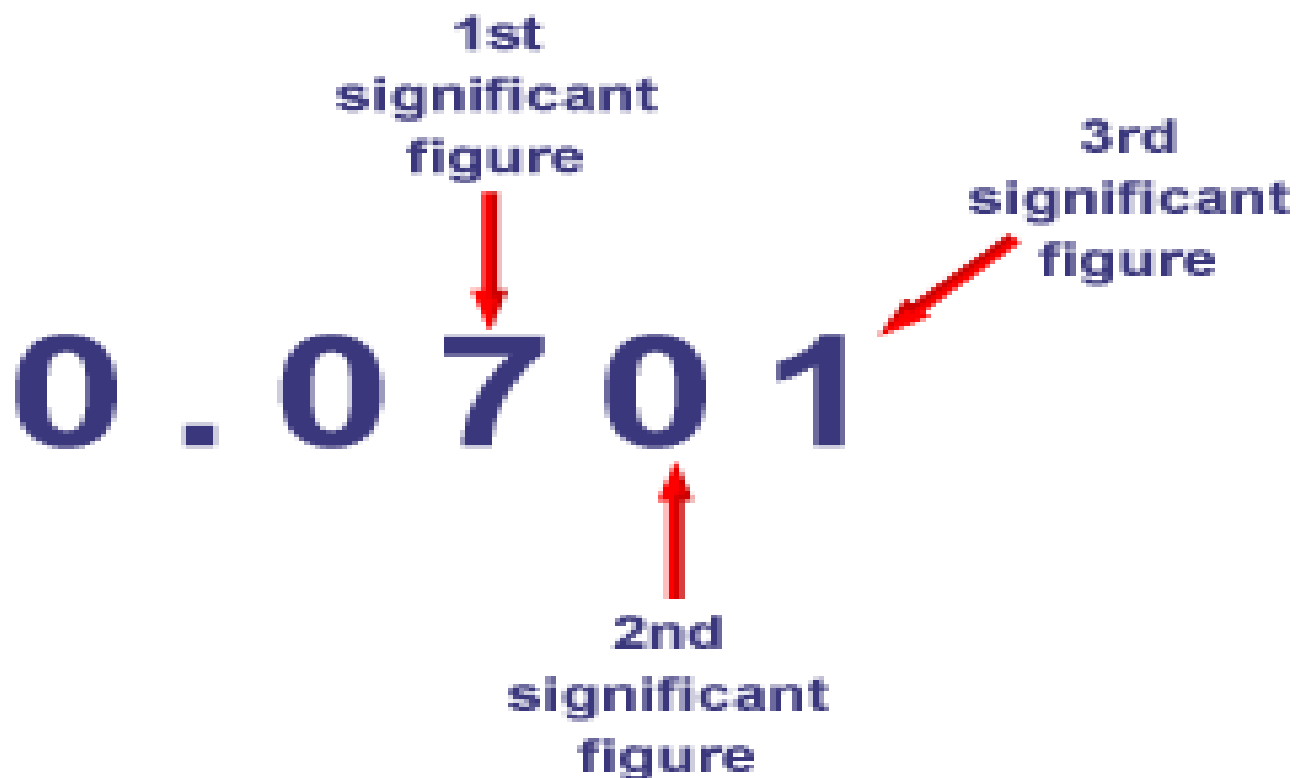
$$4.3 \times 10^6 = 4\,300\,000$$

Negative Power = Small Number

$$2.1 \times 10^{-3} = 0.021$$



Significant figures





Approximation

- This is when you work out the answer by approximating, for example, by rounding numbers.

Example: $192 + 2349$: You might round these to 200 and 2300 and your approximate answer might be **2500**.



Percentage error

$$\frac{|\text{Approximate Value} - \text{Exact Value}|}{|\text{Exact Value}|} \times 100\%$$



Number sets

Rational Numbers

Includes the other 3 sets plus repeating and terminating decimals and fractions $-0.3, \frac{2}{3}, -\frac{5}{2}, 0.666\bar{6}$ and their opposites.

Integers

Includes all the Whole numbers and their opposites. Positive and negatives. $-3, -2, -1, 0, 1, 2, 3$

Natural or Counting Numbers

These numbers can be shown with objects.
They begin with 1, 2, 3, and continue forever.

Whole Numbers

Include the natural numbers plus zero. $0, 1, 2, 3 \dots$

Irrational Numbers

These numbers are represented by non-repeating, non-terminating decimals and their opposites.

Examples: $\pi, \sqrt{3}, \sqrt[3]{5}, -\sqrt{5}$



Rules of logarithms



Simplify expressions

- Find all the like terms.
- Example:
- $6x - xy + 5x - 7xy$
 $= 6x + 5x = 11x$ and $-xy - 7xy = -8xy$
 $= 11x - 8xy$



Simplifying expressions

- Example: multiply everything in the brackets by the number in front:
- $3(2x - y + 4) + 2(x + y - 3)$
 $= 6x - 3y + 12 + 2x + 2y - 6$
- Find the like terms
 $= 8x - y + 6$



Solving equations

- Try to get the unknown, e.g. x , onto the left hand side

- Example:

- $3x - 8 = 13$

To move the 8 over to the other side, change the operation

- $3x = 13 + 8$

- $3x = 21$

- $x = 21 \div 3$

- $x = 7$



Transposing formulae



Simple and compound interest

Vocabulary:

- P = Principal
- r = Rate of interest (divide this by 100)
- t = time



Simple interest

- $I = prt$
- (Interest = principal x rate ($\div 100$) x time (years))

Example: If I save €1,200 at a rate of 3% for 4 years, how much do I have at the end of the 4 years?

$$I = prt$$

$$I = 1,200 \times (3 \div 100) \times 4$$

$$I = 144$$

I saved €1,200 and the interest is €144 so I must add the two!

$$1,200 + 144 = \text{€1,344 Total amount}$$



Compound interest

Use this formula:

$$A = P\left(1 + \frac{r}{100}\right)^n$$



Example of compound interest

- Principal = €5500, Rate = 4.3%, Number of years = 6
- $A = P\left(1 + \frac{r}{100}\right)^n$
- $A = 5500\left(1 + \frac{4.3}{100}\right)^6$ (Work out your interest first)
- Type into your calculator:
- $5500 (1 + 0.043)^6$ (Use x to the little box, and type in 6)
- = €7080.58



Income

Vocabulary:

- Gross salary - overall salary
- Net salary – Gross salary – reductions
- PRSI – Pay Related Social Insurance
- Tax – must be deducted from the gross
- Tax credits – must be deducted from total tax



Example of Income

- Remember to subtract all the deductions from the gross salary.

Helen earns €368.00 per week. Her deductions are: 20% tax, 2% PRSI, €32 tax credits. What is her net salary per week:

$$368 \times 20\% \text{ tax} = \text{€}73.60$$

$$73.60 - 32 \text{ (tax credits)} = \text{€}41.60$$

$$368 \times 2\% \text{ (PRSI)} = \text{€}7.36$$

$$\text{Gross salary} - \text{Tax} - \text{PRSI} = \text{Net Pay}$$

$$368 - 41.60 - 7.36$$

$$= \text{€}319.04 \text{ Net Salary}$$



Profit

- Profit = selling price - cost price

Example: If I buy 10 televisions for €5,000 and I sell them for €690 each, how much profit do I make if I sell all of them?

Cost to me: $5,000 \div 10 = €500$. I paid €500 for each TV.

If I sell them @ €690 each: $690 \times 10 = €6,900$. I made €6,900.

I paid €5,000 and I sold them for €6,900 so the amount of profit = $6,900 - 5,000 = €1,900$
Profit.

Percentage profit = Profit that I made \div Price that I paid $\times 100$
 $1,900 \div 5,000 \times 100 = 38\%$ **Profit**



Loss

- Profit = cost price - selling price

Example: If I buy 10 televisions for €5,000 and I sell them for €450 each, what is my loss if I sell all of them?

Cost to me: $5,000 \div 10 = €500$. I paid €500 for each TV.

If I sell them @ €450 each: $450 \times 10 = €4,500$. I made €4,500.

I paid €5,000 and I sold them for €4,500 so the amount of loss = $5,000 - 4,500 = €500$ Loss.

Percentage loss = The loss \div cost price $\times 100$

$500 \div 5,000 \times 100 = 10\%$ Loss



VAT

- VAT stands for Value Added Tax.
- Value Added Tax (VAT) is a tax charged on the sale of goods or services and is included in the price of most products and services that we use every day.

Example:

$$192.76 \times 13.5 \text{ (shift) \%} \\ = 26.02$$

Don't forget – you must add your VAT to the total!!!
= €218.78 Total Bill

Bill summary	
Your last bill	€200.00
Payments/Transactions	€200.00 cr
Balance brought forward	€0.00
Charges for this period	€ 192.76
VAT	€26.02

Total due €218.78

Pay by

Direct Debit

Payment terms are 14 days from date of bill issue or immediately if overdue.