

### Scientific Notation

$$2.3 \times 10^5 + 6.1 \times 10^6$$

The power stands for the amount of digits after the first number. Change into a long number, add them as normal and then change back into scientific notation.

### Measurement

If asked a question where measurements are in different units it is important to change them all into the same unit before attempting to solve.

### Ratio and Proportion

350 is to be divided 2:5 between Tom and Frank. How much does each get? Add the ratios to get the number of shares. Divide the amount of money by the number of shares to get the value of one share. Multiply by each of the ratios to see what each gets.

### Currency

€1 = \$0.84 find the value of \$336 Write down the exchange rate. Underneath put down the amount you want to convert and an x for the amount you are looking for. Cross Multiply

### Indices

First figure out what base number is being used (always 2, 3 OR 5) then change all the numbers in the question to this base. Learn the following rules:

(a)  $3^3 \cdot 3^4 = 3^{3+4} = 3^7$

(b)  $\frac{3^7}{3^3} = 3^{7-3} = 3^4$

(c)  $(3^2)^3 = 3^{2 \cdot 3} = 3^6$

(d)  $3^0 = 1$

(e)  $9^{\frac{1}{2}} = \sqrt{9} = 3$

(f)  $64^{\frac{1}{3}} = \sqrt[3]{64} = 4$

(g)  $8^{\frac{2}{3}} = \sqrt[3]{8^2} = \sqrt[3]{64} = 4$

(h)  $\frac{1}{3^5} = 3^{-5}$  and  $3^{-4} = \frac{1}{3^4}$

### Compound Interest Rates

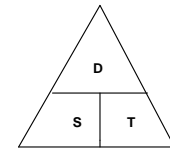
Calculate the compound interest on an investment of €6,000 at 7% p.a (per annum) for 3 years. Use percentages to calculate one years interest at a time which we add to the principal for the next years calculation.

### Income Tax

James has income of €30,000. Tax is charged on the first €14,000 at rate of 22%. The rest is charged at 40%. His Tax credits are €3,000. Calculate James' take home pay. To calculate the tax payable multiply the pay by the tax rates. Then:  
Tax Due = Gross Tax – Tax Credits  
Net pay (take home pay) = Gross Wages/ Income/ Salary – Tax Due

# Arithmetic Q1 and 2 Paper 1

### Speed, Distance and Time



Always make sure that the time is in hours only and not hours and minutes. Eg 6hrs45mins is 6.75 hours.

### Sets

$A \cap B$  A intersection B – What is common to both  
 $A \cup B$  A union B – List all the elements in A and all the elements in B  
 $A'$  A complement – List everything outside of A  
 $A/B$  A without B – List the elements in A but don't include any of B  
 $\#A$  The cardinal number of A – How many elements are in A  
 $(A \cap B)'$  Everything outside of A intersection B  
 $(A \cup B) \setminus C$  All of A and all of B but don't list any elements of C

### Estimation

Round off the numbers and then use BOMDAS to calculate in the correct order.  
Brackets Over  
Multiplication Division  
Addition Subtraction  
Work out the brackets, powers and surds first.

### Surds

Learn the following rules for surds

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$$

$$\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$\sqrt{a^2} = a$$

### Percentages

To find the % of a number multiply the number by the percentage and divide by 100  
To express one number as a % of another put one number over the other and multiply by 100.  
Percentage Profit/ Loss =  
$$\frac{\text{PROFIT} / \text{LOSS}}{\text{COSTPRICE}} \times \frac{100}{1}$$