

UPPER 3 – MAY EXAM – REVISION NOTES

Paper 1 – Non Calculator
55 minutes

Paper 2 – Calculator
1 hour 20 minutes

Content: Maths in Action - Book 3B

1. Calculations and Calculators

Estimating Calculations.

Standard Form (Scientific Notation) - *a shorthand way of writing very large or small numbers.*

Standard Form and Calculators.

Fractions – *simplifying, equivalent, mixed, top heavy, + - \times \div .*

2. Similar Shapes

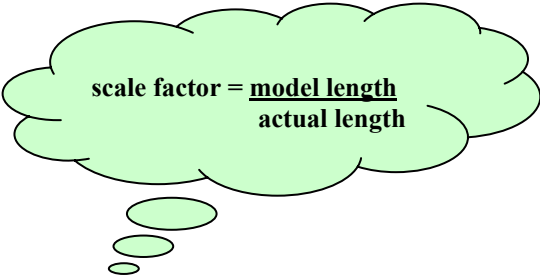
What are Similar Shapes?

Calculating Scale Factors (*enlargement and reduction*).

Proving shapes are Similar.

Similar Triangles.

Parallel Lines in Triangles.



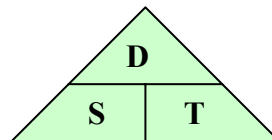
scale factor = $\frac{\text{model length}}{\text{actual length}}$

3. Going Places

Time Conversion – *minutes \leftrightarrow hours.*

Speed/Distance/Time Calculations.

Interpreting Speed Graphs.



4. Money Matters – Saving and Spending

Wages and Salaries – *annual salary, weekly wage, hourly rate, overtime, commission, bonus, part-time, self-employed, job-share.*

Savings in Banks and Building Societies;

- *Calculating Interest and Interest Rates.*

Value Added Tax (VAT) – *a tax on spending.*

Telephone, Electricity and Gas Bills.

Hire Purchase (HP) – *a method of buying goods when you don't have the money.*

Exchange Rates – *converting to foreign currency, and back again.*



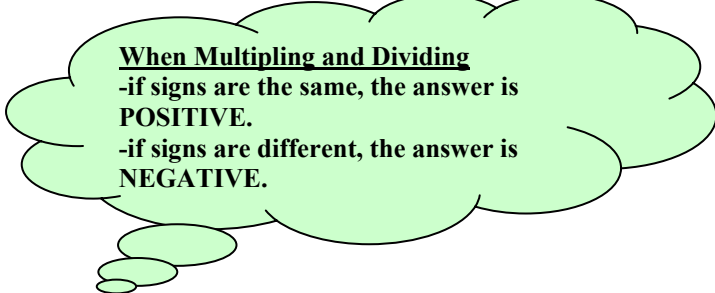
Interest = interest \times principal sum

5. Positive and Negative Numbers

Rules for Adding, Subtracting, Multiplying and Dividing.

Letters and Numbers (*example: $-2x - 3x = -2x + 3x = x$*)

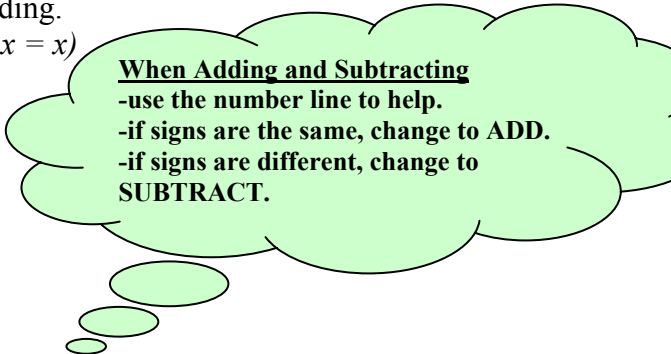
Solving Equations with Negative Numbers.



When Multiplying and Dividing

-if signs are the same, the answer is **POSITIVE.**

-if signs are different, the answer is **NEGATIVE.**



When Adding and Subtracting

-use the number line to help.

-if signs are the same, change to **ADD.**

-if signs are different, change to **SUBTRACT.**

6. Pythagoras

Relationship between the sides of Right-Angled Triangles.

To Calculate the Long Side $\rightarrow c^2 = a^2 + b^2$.

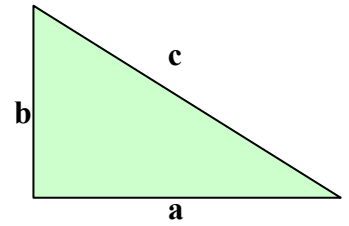
To Calculate a Short Side $\rightarrow a^2 = c^2 - b^2$.

Solving Word Problems.

3-Dimensional Problems.

Pythagoras and Coordinates.

The Converse of Pythagoras – *proving that Triangles are Right-Angled.*



7. Brackets and Equations

Expanding Brackets – *example* $5(3x-2) = 15x - 10$.

Solving Context Questions.

Solving Equations involving Brackets.

Expanding Pairs of Brackets – *eg* $(2x-3)(3x+4) = 6x^2 + 8x - 9x - 12 = 6x^2 - x - 12$.

– Use memory aid **FOIL** – **F**irst **O**utside **I**nside **L**ast.

Special Case – $(3x + 2)^2 = (3x + 2)(3x + 2)$.

8. Statistics

Understanding different types of Graphs.

Calculating the Mean, Median and Mode from a Frequency Table.

Calculating the Mean, Median and Mode from a Frequency Table with *Class Intervals*.

Cumulative Frequency Graphs.

Calculating the *Interquartile Range*.

Calculating the *Interquartile Range from Cumulative Frequency Graphs*.

Interquartile Range = Upper Quartile – Lower Quartile

9. Trigonometry

Calculate Lengths and Angles in Right-Angled Triangles.

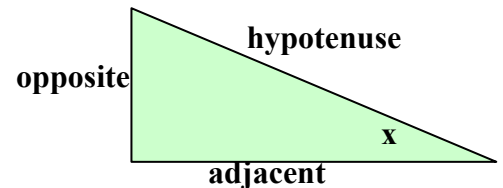
$\text{Sin}x = \text{Opposite}/\text{Hypotenuse}$.

$\text{Cos}x = \text{Adjacent}/\text{Hypotenuse}$.

$\text{Tan}x = \text{Opposite}/\text{Adjacent}$.

Use Memory Aid – **SOH CAH TOA** to help choose ratio.

Solving *Real Life* problems.



Remember! Use the SHIFT button to find angles

10. Simultaneous Equations

Remember the three methods to solve Simultaneous Equations;

– *Graphically* – *Substitution* – *Elimination*.

Using Simultaneous Equations to solve Word Problems.

Using Simultaneous Equations to find Equations of Straight Lines.

11. Areas and Volumes

Calculating Perimeters and Areas of Basic Shapes

– *square, rectangle, triangle, sectors*.

Areas of Composite Shapes.

Circle: $A = \pi r^2$; Triangle: $A = \frac{1}{2}bh$;

Rhombus/Kite: $A = \frac{1}{2}d \times d$;

Parallelogram: $A = bxh$;

Trapezium: $A = \frac{1}{2}(a + b)h$.

Prisms: $V = \text{End Area} \times \text{Length}$.

Areas of other Quadrilaterals
– *rhombus, kite, parallelogram, trapezium.*
Volume of Prisms.
Surface Area of Solid Shapes *eg Cylinder.*

12. Factors

Factorisation is the opposite process to Expanding.
Remember the three methods of Factorisation:

- *Common Factor – 2 Brackets – Difference of Two Squares.*

Always look for a Common Factor first.

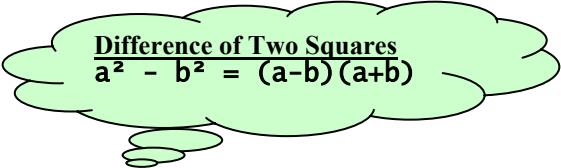
Solving Context Problems.

Harder *2 Bracket* problems when the **a** number $\neq 1$.

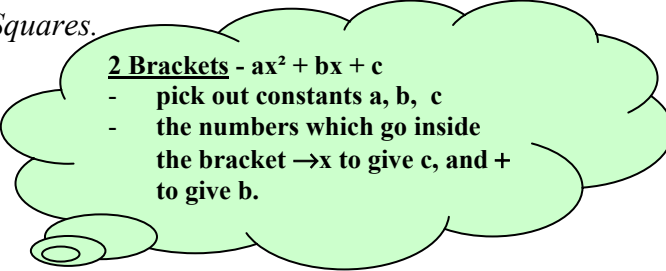
13. Money Matters – Personal Finance

14. Formulae

15. Probability



Difference of Two Squares
 $a^2 - b^2 = (a-b)(a+b)$



2 Brackets - $ax^2 + bx + c$

- pick out constants **a, b, c**
- the numbers which go inside the bracket $\rightarrow x$ to give **c**, and **+** to give **b**.