

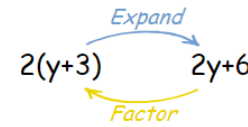
# Knowledge Organiser Maths Term 2 Year 9 Higher

The Numbers in **Red** are topics that have already been covered in either KS3 or KS4 and are being revisited to help the students to move onto more complicated topics.

The numbers in **blue** are the GCSE grade of the work being covered

In **Green** are the Mathsgeenie reference which can be used for further revision and questions to

try [www.mathsgeenie.co.uk](http://www.mathsgeenie.co.uk)



**Transformations, Constructions and Loci 10 Hours**

- \* Congruent Triangles 5 MG5
- \* Transformations 3,4 MG3,6
- \* Combination of Transformations 4 MG3
- \* Bisectors 2,3 MG4 (constructions)
- \* Loci, 4,5 MG4
- \* Plans and Elevations 3,4

**Key Words Transformations**

Congruent – the same

Loci – path of points obeying rules

**Algebraic Manipulation 7 Hours**

- \* Simplifying Algebra 2 MG1/2
- \* Factorisation 4 MG4
- \* Quadratic Expansion 4,5 MG5
- \* Expanding Squares 5 MG5
- \* Expanding More than Two Binomials 6 MG6
- \* Quadratic Factorising 5 MG5
- \* Factorising  $ax^2 + bx + c$  7 MG7
- \* Changing Subject of Formula 5-7 MG5/7

When we factorise a quadratic, we split it into two brackets which multiply to give that quadratic (the reverse of expanding).

Start with a quadratic:  $x^2 + 5x + 6$

Make into a rectangle:

Then simplify:

$x^2 + 5x + 6 = (x + 2)(x + 3)$

**Top Tip**  
You might have noticed this:  
 $x^2 + 5x + 6$   
 $2 + 3 = 5$   
 $2 \times 3 = 6$   
 $(x + 2)(x + 3)$

This trick will always work when factorising simple quadratics.

**Length, Area and Volume – 11 hours**

- \* Circumference and Area of Circles 4 MG3
- \* Area of Parallelogram / Trapezium 3,4 MG 1/2
- \* Area of Sectors and Arc Lengths 6,7 MG5
- \* Volume of Prisms 3,4 MG4
- \* Volume of Cylinders 4,5 MG4
- \* Volume of Pyramids 6 MG5
- \* Volume and surface area of cones 6 MG5
- \* Volume and surface area of spheres 6 MG5

**AREA**

Always use the perpendicular height

- rectangle: Area = base x height
- triangle: Area =  $\frac{1}{2} \times \text{base} \times \text{height}$
- parallelogram: Area = base x height
- trapezium: Area =  $\frac{(a + b) \times h}{2}$
- circle: Area =  $\pi r^2$

**Describing Rotations State...**

- The centre of rotation
- The angle of rotation
- The direction of rotation

**Describing Reflections State...**

- The line of symmetry

**Describing Translations State...**

- Movement left or right
- Movement up or down

- Or write the column vector

**Describing Enlargements State...**

- Centre of enlargement
- Scale Factor

**Volume**

Prisms: Volume = area of cross-section x length

Non-Prisms: Volume = area of base x height

Cylinders: Volume =  $\pi r^2 h$

Cones: Volume =  $\frac{1}{3} \pi r^2 h$

Pyramids: Volume =  $\frac{1}{3} \times \text{area of base} \times \text{height}$

Frustrums: You need to find the volume of both pyramids.

Spheres: Volume =  $\frac{4}{3} \pi r^3$

**Area of Circle and Sector**

area of circle =  $\pi r^2$

If  $\theta$  is measured in degrees then  
area of sector =  $\frac{\theta}{360} \times \pi r^2$