



Savio Salesian
College

Year 7 Maths Revision List – Summer 2018

The list below should give an indication of the material that Year 7 pupils will be tested on in Summer 2018. Pupils should rate their confidence in each of the skills below:

Savio Salesian College Mathematics Department

ONLINE REVISION VIDEOS

<https://vle.mathswatch.co.uk/vle>

MathsWatch



100's of FREE videos to help support students with their revision. Also includes practice questions.



SCAN THE
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MathsPad



Username:

Password:

**Raising achievement
Foundation/Higher Tier
Grades 1 – 9**

Mathematics department

Tiers

Foundation Tier (Grades 1 – 5)

Higher Tier (Grade 4 - 9)

How to revise for Maths

Below offers a guide on how best to use your time to prepare thoroughly for GCSE Mathematics.

Identify the topics into three categories:

- **Green**, **Amber** and **Red**. **Green** means you have mastered the topic, **Amber** means you are not yet secure, **Red** means this is a priority.

Develop:

- Speak to your teacher to guide you through each topic so you can start practising independently.
- Use the online resources to support your understanding and help you to develop model answers.

Consolidation:

- The best way to improve your understanding is by completing questions for each topic rather than reading over notes/revision guides. You will find practice questions, as well as guided videos to support you at home, on the Mathswatch website.
- If you are stuck, make a note of the question you don't understand and ask for support in school. During revision sessions use the opportunity to tackle your **Amber** and **Red** topics. Bring your revision list to revision!!

Mastering the skill:

- Completing past papers, in timed conditions, will be a great way to assess your understanding and to develop confidence.
- Use the past paper mark schemes to identify where the marks are going to be awarded.
- Develop revision cards to summarise the key learning points for each topics.

Don't give up:

- Replace I can't do with, I can't do it yet!!

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 4	Mathswatch clip	Green	Amber	Red
Number	Index Notation	131			
Algebra	Expanding and Simplifying Brackets - Single Set of Brackets	134a			
	Expanding and Simplifying Brackets - Double Set of Brackets	134b			
	Solving Equations - Balancing	135a			
	Rearranging Simple Formulae	136			
	Forming Formulae and Equations	137			
	Solve Linear Inequalities	139			
Ratio	Compound Units	142			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 3	Mathswatch clip	Green	Amber	Red
Number	Multiplying Decimals	66			
	Dividing Decimals	67			
	Four Rules of Negatives - Adding and Subtracting	68a			
	Four Rules of Negatives - Multiplying and Dividing	68b			
	Listing Strategies	69			
	Comparing Fractions	70			
	Adding and Subtracting Fractions - A Standard Method	71a			
	Adding and Subtracting Fractions - An Alternative Method	71b			
	Finding a Fraction of an Amount	72			
	BODMAS/BIDMAS	75			
	Calculator Questions	77			
	Product of Primes	78			
	Highest Common Factor (HCF)	79			
	Lowest Common Multiple (LCM)	80			
	Squares, Cubes and Roots	81			
	Working with Indices	82			
	Standard Form	83			
	Decimals and Fractions	84			
	Fractions, Percentages, Decimals	85			
	Rounding to Significant Figures	90			
Estimating Answers	91				
Using Place Value	92				
Algebra	Expanding Brackets	93			
	Simple Factorisation	94			
	Substitution	95			
Ratio	Exchanging Money	105			
	Sharing using Ratio	106			
	Ratios, Fractions and Graphs	107			

Geometry	Metric conversions	112			
	Problems on Coordinate Axes	113			
	Volume of a Cuboid	115			
	Volume of a Prism	119			
	Angles and Parallel Lines	120			
	Angles in a Triangle	121			
	Properties of Special Triangles	122			
Probability	Experimental Probabilities	125			
	Representing Data - Pie Charts	128a			
	Averages from a table - Basics	130a			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 2	Mathswatch clip	Green	Amber	Red
Number	Adding Integers and Decimals	17			
	Subtracting Integers and Decimals	18			
	Multiplying Integers	19			
	Dividing Integers	20			
	Inverse Operations	21			
	Money Questions - Non-Calculator Questions	22a			
	Money Questions - Calculator Questions	22b			
	Negatives in Real Life	23			
	Introduction to Fractions	24			
	Equivalent Fractions	25			
	Simplifying Fractions	26			
	Half-Way Values	27			
	Factors, Multiples and Primes	28			
	Introduction to Powers/Indices	29			
	Multiplying and Dividing by Powers of 10	30			
	Rounding to the Nearest 10, 100, 1000	31			
Rounding to Decimal places	32				
Algebra	Simplifying - Addition and Subtraction	33			
	Simplifying - Multiplication	34			
	Simplifying - Division	35			
	Function Machines	36			
	Generating a Sequence - Term to Term	37			
Ratio	Value for Money	38			
Geometry	Properties of Solids	43			
	Nets	44			
	Angles on a Line and at a Point	45			
	Measuring and drawing Angles - Measuring	46a			
	Measuring and drawing Angles - Drawing	46b			
	Perimeters	52			
	Area of a Rectangle	53			
	Area of a Triangle	54			
Probability	Listing Outcomes	58			
	Calculating Probabilities	59			
	Mutually Exclusive Events	60			
	Two-Way Tables	61			
	Averages and the Range	62			
	Data - Discrete and Continuous	63			
	Vertical Line Charts	64			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 1	Mathswatch clip	Green	Amber	Red
Number	Place Value	1			
	Ordering Integers	2			
	Ordering Decimals	3			
	Reading Scales	4			
	Simple Mathematical Notation	5			
	Interpreting Real-Life Tables - Time	6a			
	Interpreting Real-Life Tables - Timetables and Distance Tables	6b			
Algebra	Introduction to Algebraic Conventions	7			
	Coordinates	8			
Geometry	Simple Geometric Definitions	9			
	Polygons	10			
	Symmetries	11			
	Tessellations and Congruency - Tessellations	12a			
	Tessellations and Congruency - Congruent Shapes	12b			
	Names of Angles	13			
Probability	The Probability Scale	14			
	Tally Charts and Bar Charts	15			
	Pictograms	16			

Y7 Maths - Summer

Place value

The position of the digit gives its size

thousands	hundreds	tens	units	•	tenths	hundredths
4	3	5	2	•	6	1

Example
 The value of the digit '4' is 4000
 The value of the digit '3' is 300

Multiply & Divide by 10 or 100

- To **multiply** by 10, move each digit one place to the **left**
 e.g. $35.6 \times 10 = 356$

Hundreds	Tens	Units	•	tenths
	3	5	•	6
3	5	6	•	

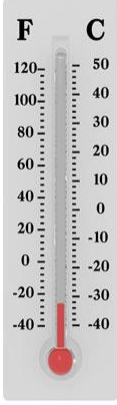
- To **divide** by 10, move each digit one place to the **right**
 e.g. $35.6 \div 10 = 356 = 3.56$

Tens	Units	•	tenths	hundredths
3	5	•	6	
	3	•	5	6

- To **multiply** by 100, move each digit 2 places to the **left**
- To **divide** by 100, move each digit 2 places to the **right**

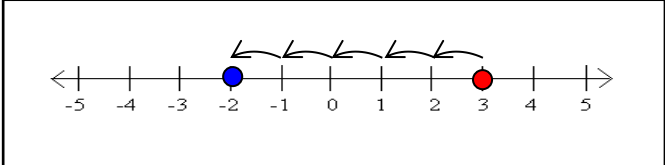
Recognise negative numbers

- These can be seen on a thermometer



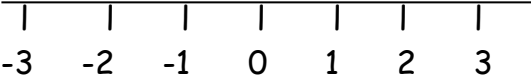
The numbers below freezing (0°) are negative

- Number line to work out sums



$3 - 5 = -2$

Order negative numbers



$2 > -2$ → We say 2 is bigger than -2
 $-1 < 3$ → We say -1 is less than 3

Order decimals

1.23 m	1.6 m	1.65 m	1.3 m
↓	↓	↓	↓
1.23 m	1.60 m	1.65 m	1.30 m

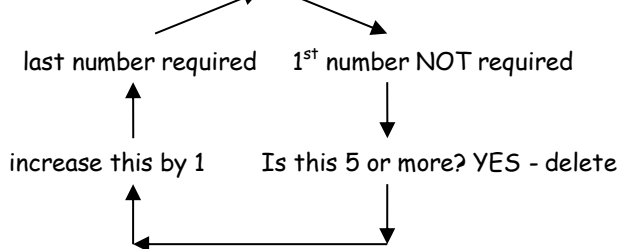
Make the number of digits the same, it is easier to order them

Smallest → Largest
 1.23 m 1.30 m 1.60 m 1.65 m

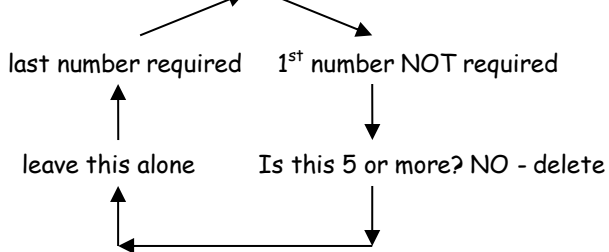
Rounding decimals

- Look at the last number required
- Look at the first number NOT required

e.g. To round 5.47 to 1dp



e.g. To round 5.43 to 1dp



Round to one significant figure

These all have ONE significant figure

4000
300
80
2
0.7
0.05
0.003

Estimate answers to calculations

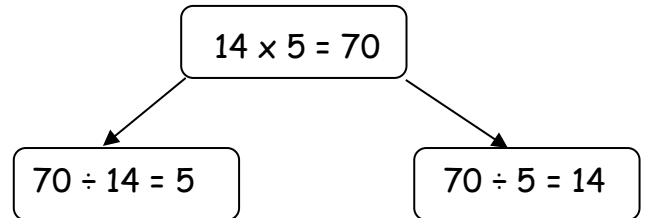
- Round each number to 1 s.f. first

e.g. $5979 \div 29 \approx 6000 \div 30 \approx 200$

e.g. $\frac{423 \times 28}{568} \approx \frac{400 \times 30}{600} \approx \frac{12000}{600} \approx 20$

Division facts from a multiplication

Any multiplication sum can be written as 2 division sums



Order of operations

Bracket
Indices
Divide
Multiply
Add
Subtract

} Do these in the order they appear

} Do these in the order they appear

e.g. $3 + 4 \times 6 - 5 = 22$

↑
first

Direct proportion

e.g.1

5 miles is approximately 8km.
How many miles are equal to 24km?

$$24\text{km} \div 8\text{km} = 3$$

$$5 \text{ miles} \times 3 = 15 \text{ miles}$$

e.g.2

It takes 90 Lego bricks to build 3 planes



How many bricks would be needed for 11?

$$1 \text{ plane uses } 90 \div 3 = 30 \text{ bricks}$$

$$11 \text{ planes will use } 11 \times 30 = 330 \text{ bricks}$$

Multiple, factor, prime & square numbers

- **FACTORS** are what divides exactly into a number

e.g. Factors of 12 are:

1	12
2	6
3	4

- **MULTIPLES** are the times table answers

e.g. Multiples of 5 are:

5 10 15 20 25

- **PRIME** numbers have only **TWO** factors

e.g.

2, 3, 5, 7, 11, 13, 17, 29, 31, 37

- **SQUARES** are the result of multiplying a number by itself

e.g. $1 \times 1 = 1$
 $2 \times 2 = 4$
 $3 \times 3 = 9$

Square numbers

Use inverse operations

- To undo ADD, just SUBTRACT

e.g. $36 + 23 = 59$ ($59 - 36 = 23$)

- To undo MULTIPLY, just DIVIDE

e.g. $7 \times 3 = 21$ ($21 \div 7 = 3$)

- Use balancing:

$20 + \square = 20 \times 4$

$20 + \square = 80$

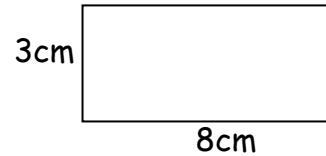
$20 + 60 = 80$ ($80 - 20 = 60$)

Area and perimeter of rectangle

Area is the amount of space inside the outline of a shape

Perimeter is the length of the outline of a shape

- **Area of rectangle = length x width**



$$\begin{aligned}\text{Area of rectangle} &= l \times w \\ &= 8 \times 3 \\ &= \underline{24\text{cm}^2}\end{aligned}$$

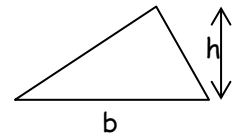
- **Perimeter of the rectangle**

$$\begin{aligned}\text{Perimeter} &= 3 + 8 + 3 + 8 \text{ OR } 2 \times 3 + 2 \times 8 \\ &= \underline{22\text{cm}}\end{aligned}$$

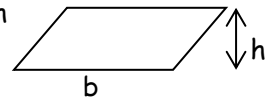
Areas

Formulae to learn:

$$\text{Area of triangle} = \frac{b \times h}{2}$$



$$\text{Area of parallelogram} = b \times h$$



Averages and Range

Mode - most frequent measure

Median - middle measure (put them in order)

Mean - total of measures \div no. of measures

Range - Highest minus lowest measure

- **Range** measures how spread out the measures are
- **Mode, median & mean** gives an average
- The range and one of the averages is used to compare distributions

Calculate with fractions

Add & subtract fractions

~Make the denominators the same

e.g. $\frac{1}{5} + \frac{7}{10}$	$\frac{4}{5} - \frac{10}{15}$
$= \frac{2}{10} + \frac{7}{10}$	$= \frac{12}{15} - \frac{10}{15}$
$= \frac{9}{10}$	$= \frac{2}{15}$

Calculate fraction of quantity

To find $\frac{4}{5}$ of a quantity $\div 5 \times 4$

e.g. $\frac{4}{5}$ of £20 = $20 \div 5 \times 4 = \text{£}16$

Expand and Simplify Algebraic Expressions

~Expand $3(2x + 5)$

~Draw a table if needed

~Multiply each term in the brackets by the one outside the brackets

	2x	+5
3	6x	+15

$= 6x + 15$

~Expand and simplify $2(y - 6) - 4(3y - 8)$

	y	-6
2	2y	-12

	3y	-8
-4	-12y	+32

$2y - 12 - 12y + 32$

Simplified = $-10y + 20$

Negative numbers

Remember the rules:

- When subtracting go down the number line
- When adding go up the number line
- $8 + -2$ is the same as $8 - 2 = 6$
- $8 - +2$ is the same as $8 - 2 = 6$
- $8 - -2$ is the same as $8 + 2 = 10$

Indices

- To multiply powers of the same base, add the indices.

$$x^a \times x^b = x^{(a+b)}$$

a $\frac{(k^3 \times k^2)^7}{k} = \frac{(k^5)^7}{k}$ 3 + 2 = 5
 $= \frac{k^{35}}{k}$ 5 \times 7 = 35
 $= k^{34}$ Remember k is really k¹.
35 - 1 = 34

- To divide powers of the same base, subtract the indices.

$$x^a \div x^b = x^{(a-b)}$$

- When finding the 'power of a power', multiply the indices.

$$(x^a)^b = x^{a \times b}$$

~Tally Tables

A class has 30 students. Lisa asks each student whether they walk to school (Y) or not (N).

Y N N Y N Y N N Y N
 Y N Y Y N N N Y N N
 N N N N N Y Y Y N Y

a Complete a data collection sheet (a tally chart).

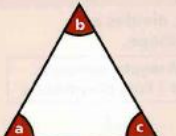



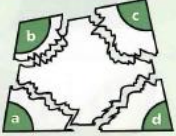

b Find the proportion of students in the class who walk to school.

a

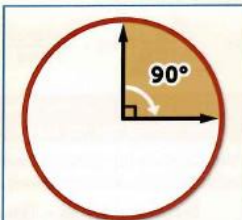
Do you walk to school?	Tally	Number
Yes		12
No		18

b The proportion of students who walk to school is 12 out of 30.

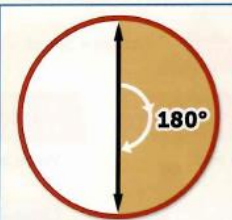
Angle Properties

<p>Take a triangle</p>  <p>Angles add up to 180°</p>	<p>Tear off the angles</p> 	<p>They add up to 180°</p>  <p>Angles on a straight line add up to 180°</p>
<p>Take a quadrilateral</p>  <p>Angles add up to 360°</p>	<p>Tear off the angles</p> 	<p>They add up to 360°</p>  <p>Angles around a point add up to 360°</p>

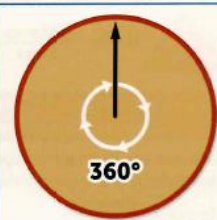
The turn, or rotation, between two meeting lines is called an angle. Angles are measured in degrees ($^\circ$), often with a protractor or angle measurer.



There are 90° in one-quarter of a rotation.



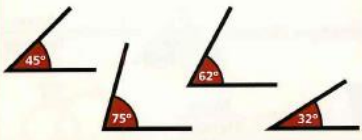
There are 180° in half a rotation.



There are 360° in one complete rotation.

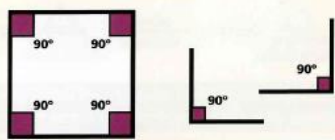
Acute Angles

Angles less than 90° are called **acute angles**.



Right Angles

Angles that are 90° are **right angles** and are marked with a small square.



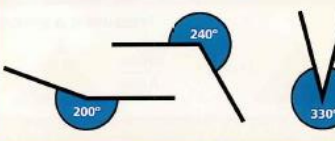
Obtuse Angles

Angles greater than 90° but less than 180° are called **obtuse angles**.



Reflex Angles

Angles greater than 180° are called **reflex angles**.

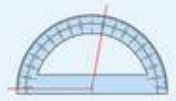


Can you estimate and measure the size of these angles here? Are they **acute**, **obtuse**, **right** or **reflex** angles?



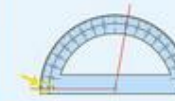
How To Use a Protractor

1 Place the cross or circle at the point (vertex) of the angle that you are measuring.



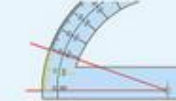
How To Use a Protractor

2 Read from the zero on the outer scale of your protractor.



How To Use a Protractor

3 Count the degree lines carefully.



How To Use a Protractor

Tip! It is a good idea to estimate the angle before measuring.



How To Use a Protractor

1 Place the cross or circle at the point (vertex) of the angle that you are measuring.



2 Read from the zero on the outer scale of your protractor.



3 Count the degree lines carefully.

