



**MATHEMATICS ENTRANCE EXAMINATION SYLLABUS  
AND SAMPLE QUESTIONS FOR 10+, 11+ AND 12+ AGE GROUPS**

- Group A – Boys aged 10+ as at 1<sup>st</sup> September
- Group B – Boys aged 11+ as at 1<sup>st</sup> September
- Group C – Boys aged 12+ as at 1<sup>st</sup> September

Calculators are **NOT** allowed.

## WHITGIFT SCHOOL

### ENTRANCE EXAMINATION SYLLABUS

Mathematics (Group A) – Boys who will be aged 10 years and under 11 years as at 1<sup>st</sup> September on year of entry.

Boys are expected to be working at level 4 of the National Curriculum.

Topics examined will include:

Place value

The four basic operations (+, -, ×, ÷) applied to whole numbers but excluding long division

Simple fractions, percentages and decimals including their use in real situations

Squares, factors, multiples, divisibility and primes

Calculations involving time, distance and speed

Simple ideas of proportion and ratio

Number sequences and other simple patterns

Congruence of shapes, angle measurement, use of compasses and protractor

Perimeter, area and volume of simple shapes

12-hour and 24-hour time

Bar and line graphs

Reflective and rotational symmetry of 2D shapes

Mathematics (Groups B and C) – Boys who will be aged 11 years and under 13 years as at 1<sup>st</sup> September on year of entry.

Boys are expected to be working at Level 5 of the National Curriculum.

Topics examined in addition to those above will include:

Adding, subtracting and using negative numbers in context

The four basic operations applied to decimals, including long division by a whole number

Area of a triangle

Estimation of measures used in everyday situations

Averages of sets of discrete data

Pie charts

Simple probability

Formal algebra is excluded

## SAMPLE QUESTIONS

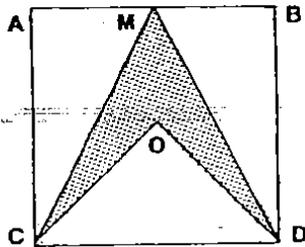
The questions which follow have been set in past entrance examinations and have been selected to demonstrate the ways in which both basic skills and understanding of simple concepts are tested. A complete paper consists of about 25 questions to be answered in 1 hour. Two thirds of these are straightforward and for the remainder we hope candidates will enjoy trying to puzzle out some of the answers.

### Groups A, B and C

- $$\begin{array}{r} 192 \\ +888 \\ \hline \end{array}$$
- $$\begin{array}{r} 888 \\ -192 \\ \hline \end{array}$$
- $14 \times 7 \times 2$
- $18 - 17 + 16 - 15 + 14 - 13$
- $531 \times 135$
- $12321 \div 9$
- $\pounds 1.28 + 57\text{p}$
- $\pounds 1.28 - 57\text{p}$
- Write in figures the number forty-two thousand and eight. How much is this number less than one million?
- A plane leaves London Airport at 16:30 and takes  $5\frac{3}{4}$  hours on its journey. At what time does it arrive?
- (a) Express 51km in metres (b) Express 510cm in metres
- I used my calculator to work out  $(31 \times 9) \div 52$ . Before doing so I worked out in my head that the answer should be about 6. What simple calculation did I do in my head?
- What percentage is 15p out of  $\pounds 3.00$ ?
- David jogs at 3 metres per second. How far does he jog in 15 minutes?
- Write each of these amounts to the nearest hundred pounds:  
(a)  $\pounds 675$  (b)  $\pounds 2,945$  (c)  $\pounds 90,095$
- Ravi has 32 sweets. He eats 24 of them. What fraction of the sweets has he eaten? Write your answer in its simplest form.
- To cook a joint of meat, you leave it in the oven for 30 minutes for every kilogram it weighs plus 20 minutes extra. Find how long you would cook a joint weighing:  
(a) 2 kg (b)  $3\frac{1}{2}$  kg
- To go and watch a film at the cinema, the seats cost  $\pounds 3$  each for a child and  $\pounds 7$  each for an adult. I was charged  $\pounds 51$  for all of the seats I bought.  
(a) Did I buy more than 7 adult tickets?  
(b) If there were more adult tickets than child tickets, how many of each did I buy?  
(c) If there were more child tickets than adult tickets, how many of each did I buy?

19. What fraction of the whole square below is the shaded area?

O is the centre of the square and M is the midpoint of AB.



20. Write down in rising order of size all the 3-digit numbers which can be formed by using the digits 7,8 and 9 once each. The first is 789.

21. Here is a numbers game. There are two numbers which are first added together and then multiplied together. Fill in the gaps in the table (the first row is done for you).

First Number	Second Number	Numbers Added Together	Numbers Multiplied Together
4	7	11	28
5	12		
9		16	
	20		1000
		18	45
		20	96

**Additional Questions for Groups B and C:**

1. 
$$\begin{array}{r} 1177 \\ +6823 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 5.031 \\ -0.287 \\ \hline \end{array}$$

3.  $6 \times \dots = \text{£}9.60$

4.  $\dots \div 8 = 1.05\text{cm}$

5.  $12321 \div 37$

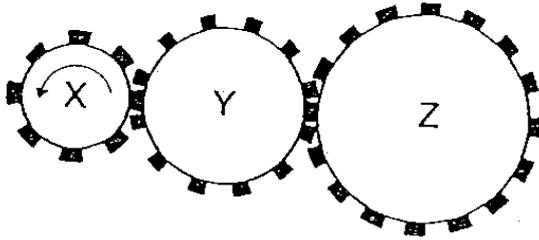
6. A rectangle measures 4.0cm by 7.1cm. What is its area?

7. There are 40 coloured counters in a box. Half of them are red, one-fifth are yellow and the rest are green.

(i) How many are green?

(ii) If I shake the box and then pick out one counter, what is the probability that it is green?

8. Three gear wheels turn one another. X has 8 teeth, Y has 12 teeth and Z has 16 teeth. In one minute, X turns 30 times. In this time, how many turns do Y and Z make? Draw arrows to show the directions in which Y and Z move.



9. A box of kiddimix contains 20 chocolates of which 8 are plain chocolates and 12 are milk chocolates. If 16 of the 20 have soft-centres, what can you say about how many plain chocolates there are with soft-centres?
10. James gives these answers to four questions. Tick any you think are likely to be correct.
- (i) A lorry weighs 2000 grams
  - (ii) A ten year old boy weighs 35 kilograms
  - (iii) Big Ben's tower is 200 centimetres high
  - (iv) A horse is 15 metres high
11. The favourite sports of a group of 100 boys are shown in the table below. Calculate the missing number and draw a bar chart or a pie chart to illustrate this information.

Cricket	15
Rugby	25
Soccer	
Other	10

12. Each of the symbols  $\Delta$ ,  $\square$ ,  $\diamond$ ,  $\circ$  and  $\bullet$  stand for a different whole number. The numbers are connected by the following rules. Write down what number each of the five symbols stands for:

$$\Delta - \bullet + \diamond - \square + \circ = 0$$

$$\square \div 4 = \diamond$$

$$\Delta - 5 = \bullet$$

$$14 \times \bullet = \circ$$

$$\square + \diamond = 15$$

$$\Delta = \dots\dots\dots$$

$$\square = \dots\dots\dots$$

$$\diamond = \dots\dots\dots$$

$$\circ = \dots\dots\dots$$

$$\bullet = \dots\dots\dots$$