Mathematics Entrance Exam Syllabus for 10+ Entry to City of London School

There will be one paper, lasting 3/4 hour. Candidates can write in either pencil, blue or black ink. They will need a ruler. Calculators are not allowed.

The exam will be based on the topics below.

Number

Whole numbers: reading, writing, ordering; adding and subtracting 3-digit numbers; multiplying and dividing 2-digit numbers by 1-digit numbers; multiplying by **10** or 100; solving problems involving such multiplication or division; place value; rounding numbers to the nearest whole number, or nearest 10, or 100; checking that results are reasonable by estimation, or by referring to their knowledge of the context.
Using decimal notation to 2 decimal places, especially in context of money and measurement, including addition and subtraction. Ordering decimals given to 3 decimal places. Understanding and using simple fractions and percentages in context.
Understanding and using the words 'square', 'cube', 'multiple', 'factor'. Candidates should know the square roots of the numbers 1, 4, 9, 16, 25, ..., 100. Recognising, describing, and continuing simple number patterns and sequences. Using simple formulae expressed in words. Using co-ordinates in the first quadrant.

Shape, space and measures

Estimating length, area, volume, time, mass (often called 'weight') in familiar units. Reading a scale, such as a thermometer or speedometer. Appreciating the relationship between units such as millilitres and litres. Finding perimeters of simple shapes; finding areas by counting squares, including approximating when necessary; finding volumes by counting cubes in isometric drawings. Sorting 2-D and 3-D shapes in various ways, giving reasons. Reflecting simple shapes in mirror lines. Constructing (with reasonable accuracy) simple 2-D shapes from given information. Understanding and using the phrase 'right angle' and the words 'triangle', 'square', `pentagon', 'hexagon', 'rectangle', 'circle', 'cube', 'cuboid', 'cylinder', 'sphere'. Understanding and using the eight points of the compass. Following instructions to locate places on maps.

Handling data

Handling data: tally tables, bar charts, pictograms, frequency diagrams, decision trees, time tables and other tabulated information; finding and using the mode and range of a set of data; grouping data; the language associated with probability (certain, likely, unlikely, impossible, fair, unfair). Drawing and using simple line graphs (such as a conversion graph, or a graph showing a patient's temperature).

Name: ________________ **Candidate Number:** ___________

City of London School

SPECIMEN 10+ ENTRANCE EXAMINATION MATHEMATICS

GROUP 1 TIME: 45 minutes

Answer as many questions as you can in the spaces provided.
Show all your working clearly.
Be careful not to spend too long on any one question.
You will need a ruler and pencil (or pen).

No calculators are allowed.
No spare paper will be provided.

1. a) Write down all the whole numbers you can find which will divide exactly into 36:

____

b) Which two numbers multiply to give you 36 but add to give you 13?

____

c) Which two numbers multiply to give you 36 but have a difference of 9?

____

2. Work out

a)

7	4	8
5	9	7

b)

6	9	5
4	5	8

c)

	8	6
x		7

3. Fill in the missing spaces in the following patterns

a) 14, ______, 28, 35, ______

b) 17, 14, ______, ___8,

c) 0.5, ______, ___2, , ___8, 16

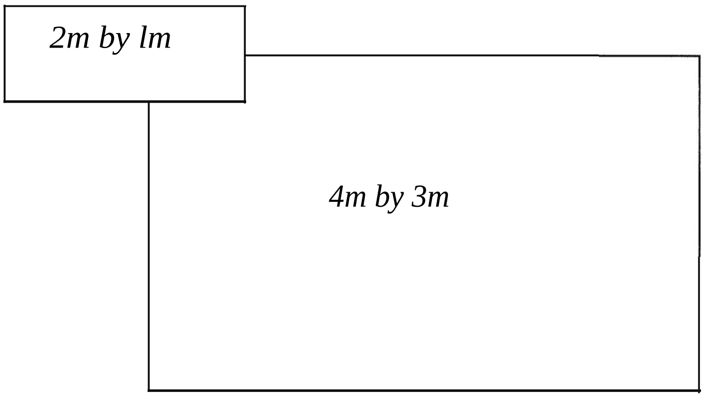
d) 256, 64, ______, 4, 1, ______

4. Sarah buys 15m of dress material. She uses 4.39m on her dress, 3.44m on her skirt, 47 cm on a scarf and 4cm on a ribbon.

How many centimetres of material will she have left?

__________________________CM

5.



The diagram shows a small rectangle of 2m by 1m and a large rectangle of 4m by 3m. They are not drawn to scale.

a) How many of the small rectangles will fit into the larger one?

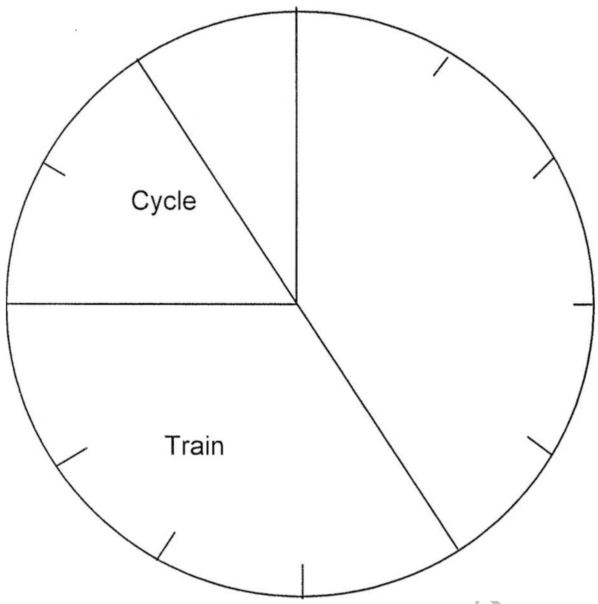
____

b) The larger rectangle is now stretched to fit 9 small ones into it. The length of 3m is kept the same.

How much longer must we make the other side?

____

6. In a class of 24 boys 2 walked to school
4 cycled
a larger number travelled by train
the London Underground was the most popular form of transport



The pie-chart shows this information but it is not complete.

Write in the other two forms of transport.

a) How many boys travelled by train?

____

b) How many boys used the London Underground?

____

c) What fraction of the boys cycled to school?

____

7. Copy these words as they would look on the other side of the mirror. Three of the letters have been done for you.

Mirror

C	I	T	Y								T		
O	F												0
	O	N	D	O	N								
S	C	H	O	O	L					0			

8. 4, 5, 6 are consecutive numbers. Their sum is 15 and they multiply to give 120.

a) Find three consecutive numbers which have a sum of 60.

____

b) Find three consecutive numbers which multiply to give 60.

____

9. Fill each space with a figure that will make the answers correct

a)

$$\begin{array}{rrrr} & \square & 8 & 7 \\ + & 6 & \square & 6 \\ \hline & 8 & 1 & \square \end{array}$$

b)

$$\begin{array}{rrrr} & 5 & 4 & \square \\ - & \square & 8 & 7 \\ \hline & 2 & \square & 9 \end{array}$$

c)

$$\begin{array}{rrrr} & & \square & 7 \\ \times & & & \square \\ \hline & 1 & 1 & 9 \end{array}$$

10. a) i) What fraction of a day is 6 hours?
Simplify your answer as much as possible.

____

ii) What fraction of a 7 day week is 6 hours?
Simplify your answer as much as possible.

____

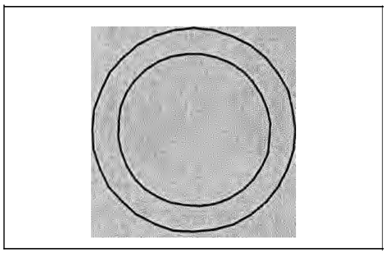
b) An examination is to last 1 hour 15 minutes.
It starts at 11.27am.

When does it finish?

____

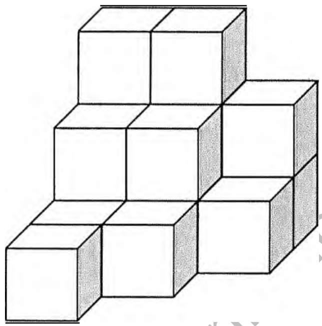
11. Use your ruler to measure in centimetres the lengths of the lines marked P, Q and R.

Q



P ____________ Q= ____________ R ____________

12.



The shape above is made up of 2cm cubes loosely stacked in a corner of a room.

a) How many cubes are there?

____

b) How many more would you need to make a 10cm by 10cm by 10cm cube?

____

13. a) Paul wants to give a present of one stamp, one coin and one sweet to Mark. Paul has two different stamps, two different coins and two different sweets to choose from. How many different ways can he make up the present?

____

b) Paul changes his mind. He decided to give just two coins instead. How many ways could Paul do this?

____

14. Simon concentrates in class fora of the time while Stephen does so for 70% of the time. Samuel concentrates for $_3$ of the time and Saul does so for point eight of the time.

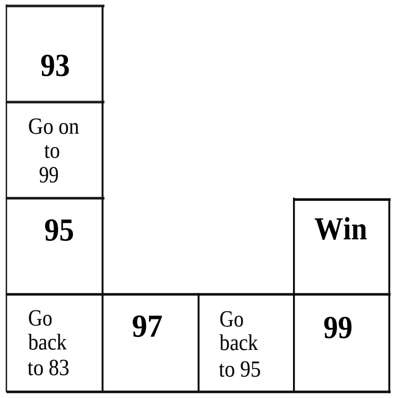
a) Which boy concentrates the most?

____

b) Which boy concentrates the least?

____

15. The diagram below shows the end of a dice game that James was playing.
He can throw anything from 1 to 6.
To win, his throw must lead him to land exactly on the Win square.



List the ways that James can finish to win in exactly two throws if he is on

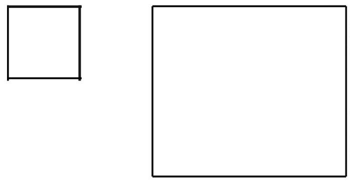
a) square 97

____

b) square 93

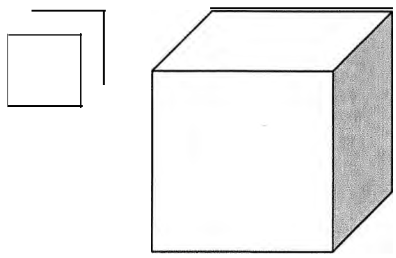
____

16. a) i) How many small squares of width 2cm can I cut out of a large square of width 4cm?



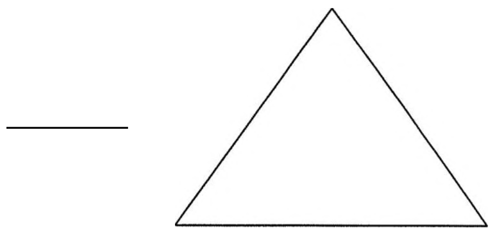
____

ii) How many small cubes of width 2cm can I cut out of a large cube of width 4cm?



____

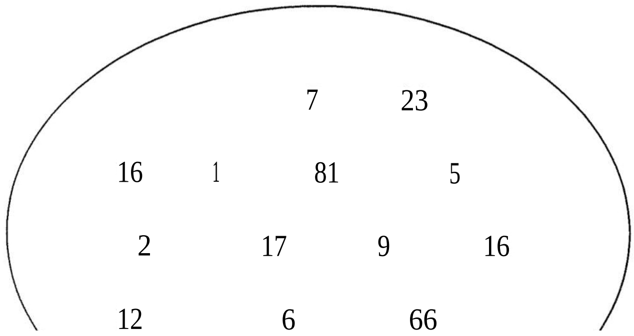
iii) How many small triangles of width 2cm can I cut from a large triangle of width 4cm?



____

 www.FirstRanker.com

17.



a) Which of the numbers above are prime numbers?

b) Which of the numbers above are multiples of 3?

c) Which of the numbers are square numbers?

18. Here is a timetable of a certain space flight:
a)

6.22am	Blast Off
6.37am	Space Craft goes into Orbit
7.41 am	First Orbit Completed

The second orbit takes three minutes less than the first.
The third takes two minutes less than the second.
The fourth takes one minute less than the third.
After the fourth orbit the craft falls to earth in 38 minutes.

At what time did the craft

a) Complete the second orbit?

____

b) Complete the third orbit?

____

c) Touch down?

____

19. Find all the three digit numbers for which the sum of the digits equals 25.

Find of Exam

GROI

1 2, 6, 9, 2. 1g, It

(c-,)

1 31 5 (I') '731 (c) t 0 7

7 - () 35 4-2,

(k) / 5

(c,) 0,5, I 2) 4-, g L6

(d) 2.‹:5t, t6

tr. if-37 Ttf-4= 47 4- 4- 834 c-

1, 500

5_ (R.) 1,3

L. 1-- 2)(L 1 Lvret

-s ac_

'8 It) 1-0 c)

y r

q 0

0 a vi 0

-l ook Da

tm) Lid 71 t

1---) 1IJ 00) lc) flJ

-f tat

LIT :1119 LL 2

(&)

(tf-Zrt,

11_, L,g

(b) – 102

13. (a) 2×2×2

(b) 1

14. (a) Saul

(b) Samuel

[3/4 = 0.75
70% = 0.7
2/3 = 0.666...]

ti5 0 r 2, 1.

11) J, L

rr

c-r- 4, L

t'k) (i) g (14' t

L'7_ 14 2-, 5, 7, II '2-3

(b) 6 2, t2 U g

(c) L,

Lg., L

1st orbit = 1 hr 4 mins
2nd orbit = 1 hr 1 min
3rd orbit = 59 mins
4th orbit = 58 mins

(a) 8.42 am

(b) 9.41 am

(c) 11.17 am

1:)) Vs/

27 .7, y77-