St Mary's School
CAMBRIDGE

Year 9 Maths
Sample Entrance Examination

Time allowed: 60 minutes

Name: _____

INSTRUCTIONS

1. You may **NOT** use a calculator.
2. Work through as many questions as you can.
3. Full marks will be given to solutions that show a complete method.
4. If you do not understand a question, miss it out and go on to the next one.
5. When you have done all that you can, return to the question(s) that you have missed.

1. Find the value of $2^3 \times 5^2$

Answer: _____

2. Write 300 as a product of prime numbers, giving your answer in a form that involves indices as in question 1.

Answer: _____

3. Calculate 5.06 x 7.2

Answer: _____

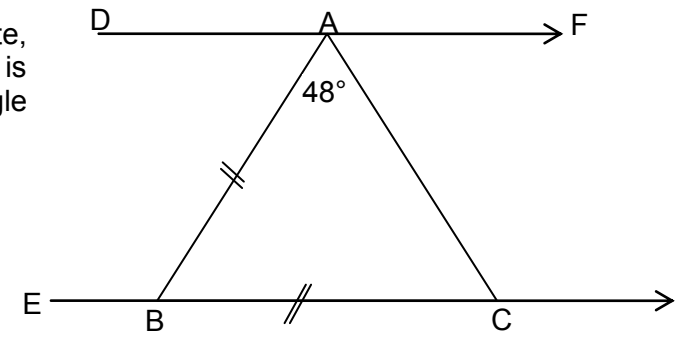
4. (i) Express 6¼ as a top heavy fraction

Answer (i): _____

(ii) Hence find the square root of 6¼

Answer (ii): _____

5. In the diagram shown opposite, DF is parallel to EC and AB is equal in length to BC. Angle BAC = 48°



Calculate:

(i) Angle ABC

Answer: Angle ABC = _____

(ii) Angle BAD

Answer: Angle BAD = _____

(iii) Angle ABE

Answer: Angle ABE = _____

6. Two boxes inside a larger box each have five boxes inside them. How many boxes are there in total?

Answer: _____

7. The table below gives information about pupils in a school.

	Left handed	**Right handed**
Boys	103	447
Girls	87	363

(a) How many pupils are there in the school?

Answer (a): _____

(b) What % of the school are left handed?

Answer (b): _____

(c) What is the ratio of boys to girls?
[Leave your answer in the form p : q where p and q have no common factor]

Answer (c): _____

(d) One person is chosen at random from the pupils at the school. What is the probability that the person chosen is a left handed girl?

Answer (d): _____

8. Write 0.225 as a fraction in its lowest terms.

Answer: _____

9. Calculate the following [**leave fractions in their lowest form**]

$$\frac{2}{3}+\frac{7}{12}$$

Answer: _____

10. Write down the next number in each of the following sequences:

(a) 1, 6, 11, 16, 21, _____

(b) $\frac{1}{25}$, $\frac{1}{5}$, 1, 5, 25, _____

(c) 45, 90, 30, 120, 24, _____

11. A train is timetabled to take 1 hour and 45 minutes to travel from Paddington, London to Bristol Templemead. It leaves Paddington at 10.22am. At what time should it arrive in Bristol?

Answer: _____

12. Find 35% of £10.40

Answer: £ _____

Find 140% of 560 grams

Answer: _____ g

13. Solve the following equations:

(a) $3x + 4 = 19$

Answer: x = _____

(b) $3(x + 6) = 15 - 2x$

Answer: $x =$ _____

(c) $\frac{2x}{5} - 3 = 1$

Answer: $x =$ _____

14. Estimate the answer to 117 x 28

(a) Write down your estimate.

Answer: _____

(b) Show how you made your estimate

(c) Now work out the exact answer to 117 x 28 without using a calculator. *You must show all your working or you will receive no marks.*

Answer: _____

15. Simplify:

(a) $2a \times 6a =$

(b) $2b^2 \times 4b \times a =$

16. Divide £64 between two sisters in the ratio 3 : 5

Answer: _____

17. In the diagram

<table>
<tr><td colspan="4">x</td></tr>
<tr><td>y</td><td colspan="2">z</td><td>m</td><td>w</td></tr>
<tr><td colspan="2">r</td><td>s</td><td colspan="2">t</td></tr>
</table>

$x = y + z + m + w$

$x = r + s + t$

Complete each of the following by putting a letter in each empty box:

(a) $t = m +$ ☐

(b) $(y + z) - r =$ ☐

(c) $x - t = y +$ ☐

(d) $x - (y + z) =$ ☐ + ☐

18. In Year 8 of Clifton Hill School there are 120 pupils. Each pupil was asked in their form period whether or not they liked Art and PE lessons. Out of the year, $\frac{1}{20}$ were away on the day of the survey and out of the children who were present, $\frac{5}{6}$ said that they liked Art.

(a) How many children missed the survey?

Answer (a): _____

(b) How many pupils **did not like** PE?

Answer (b): _____

Out of the pupils who liked PE, a further $\frac{3}{4}$ of the pupils said that they liked Art as well.

(c) How many pupils liked both subjects?

Answer (c): _____

(d) How many pupils disliked both subjects?

Answer (d): _____