THE GRAMMAR SCHOOL
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MATHEMATICS ENTRANCE EXAMINATION
ENTRY TO YEAR 9, SAMPLE PAPER

Time Allowed: 60 minutes

Show all steps in any calculation and state the units.

Write your answers in the spaces provided.

Calculators are not allowed.

Try to answer all the questions.

Some of the questions may seem unfamiliar. Do not spend too much time on these at first, but move on to questions you like more. You can always return to the unusual ones later.

Your full name:_____

Your current school:_____

1. (a). Write down the first six multiples of 18.

(2)

(b). Find the Lowest Common Multiple of 12 and 18.

(1)

(Total: 3 marks)

2. Simplify

(a) $3x + 2y + 7x - 4y + 7$

……

(2)

(b) $12x^2 + 6x + 3x^2 + 5 \ - 2x - 4x^2 - 7$

……

(2)

(Total: 4 marks)

3. If $600 = 2^3 \times 3 \times 5^2$ and $108 = 2^2 \times 3^3$ find:

(a) The Highest Common Factor

(2)

(b) The Lowest Common Multiple

(2)

(c) Write 96 as a product of its prime factors.

.....

(3)

(Total: 7 marks)

4.

(a) Simplify the ratio 15 : 25

……(1)

(b) Alex and Beth divide £30 in the ratio 2 : 3
How much do they each get?

……(2)

(c) Charlie and David divide some money in the ratio 7 : 2
David gets £56. Find the total amount of money they split.

……(2)

(Total: 5 marks)

5. Find the value of the following. You must show your workings to gain any credit, and fully simplify any fractions.

(a) $\frac{2}{7} - \frac{3}{11}$

(2)

(b) $2\frac{3}{4} + 1\frac{5}{6}$

[Give your answer as an improper fraction or mixed number]

(3)

(c) $3\frac{3}{7} \times 3\frac{1}{3}$ [Give your answer as a mixed number]

(4)

(Total: 9 marks)

6. Expand

(a) $7(x + 3)$

……

(1)

(b) $3x(2x - 2)$

……

(2)

(c) $-2(x - 4)$

……

(2)

(Total: 5 marks)

7. $4 - 13 =$ ……. $2 \times (-6) =$ ……. $20 \div (-4) =$ …….

$8 - (-5) =$ ……. $(-10)^2 =$ ……. $(-2) \times (-6) =$ …….

(Total: 6 marks)

8. Fill in the spaces in the table below. The first row has been completed for you.

   Any missing fractions should be given in their simplest form.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$		
	0.6	
		24%
	0.025	
$\frac{7}{8}$		

(Total: 5 marks)

9. Solve, giving answers as fractions where appropriate.

(a) $3x + 2 = 14$

$x =$.....

(2)

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

$x =$.....

(3)

(c) $12x - 4 = 3x + 7$

$x =$.....

(3)

(Total: 8 marks)

10.

$$y = 4x + c$$

(a) If $x = 7.5$ and $c = 5.4$, work out the value of y.

y = ...

(2)

(b) If $y = 18.8$ and $c = -2.4$, work out the value of x.

$x =$ .....

(2)

(Total for question: 4 marks)

11. A box containing tomatoes has a total mass of $5\frac{1}{4}$ kg. The box, when empty, has a mass of $1\frac{7}{8}$ kg. What is the mass of the tomatoes? Give your answer as a mixed number.

$mass =$.....kg

(Total: 4 marks)

End of paper.

Check your answers carefully

Total marks for paper = 60