

Entrance Examinations (13+)

2018

MATHEMATICS

One hour

- Answer as many questions as possible, presenting your answers clearly and neatly and showing all relevant working in the spaces provided.
- Calculators may be used in any question unless stated otherwise. In a question where a calculator is prohibited, your working must display sufficient detail to show that it has not been used.
- If you cannot do a question, leave it and go on to the next. You might need to move fast to get to the end of the paper.

There are 19 questions; the total number of marks available is 75.

Name: Age:

Present school:

1 Work out 12% of 480m

..... [2 marks]

2 Write each of these correct to 2 decimal places.

a 2.654

b 5.107

.....

.....

..... [1 mark]

..... [1 mark]

3 Change the following amounts by the percentages shown.

a Increase £78 by 13%

b Decrease £426 by 18%

.....

.....

..... [2 marks]

..... [2 marks]

4 Simplify each of the following.

a $2(q + 3) + 3(q - 4)$

.....

..... [2 marks]

b $x^2 \times x^5$

.....

[1 mark]

c $\frac{y^6}{y^3}$

.....

..... [1 mark]

5 Write each of these correct to 3 significant figures

a 5634

b 80251

.....

.....

..... [1 mark]

..... [1 mark]

6 Evaluate each of these, showing ALL of your working.

Cancel the answer to its simplest form or write as a mixed number as appropriate.

a $\frac{2}{5} + \frac{1}{3}$

b $\frac{2}{3} - \frac{2}{5}$

.....
.....
.....

[2 marks]

.....
.....
.....

[2 marks]

c $\frac{3}{8} \times \frac{2}{9}$

d $\frac{9}{14} \div \frac{3}{7}$

.....
.....
.....

[2 marks]

.....
.....
.....

[2 marks]

7

Arrange in order of ascending size (smallest first)

5×10^{-3} , 1.3%, 0.015, $\frac{8}{1000}$

.....[3 marks]

8

(a) Showing your working (and without using a calculator), estimate the answer to

$$\frac{(13.2)^2 + 29.7}{6.9 \times 1.491}$$

..... [3 marks]

(b) Now work it out on your calculator instead. Give your answer correct to 3 significant figures.

..... [2 marks]

9 Solve these equations:

a $3(x - 4) = 15$

b $5x - 3 = 2x + 9$

.....
.....
.....
..... [3 marks]

.....
.....
.....
..... [3 marks]

10 Divide £230 in the ratio 2:3.

.....
.....
..... [3 marks]

11 I buy a car at £1700 and sell it for £2040. Calculate

a my profit

..... [1 mark]

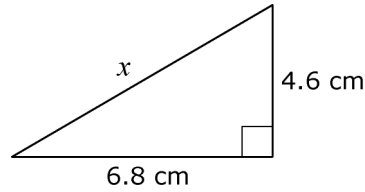
b my percentage profit

..... [2 marks]

12 Which is larger, $\frac{2}{3}$ of $2\frac{2}{5}$ or $\frac{2}{5}$ of $2\frac{2}{3}$? Show your working.

.....
.....
.....
..... [3 marks]

13 Find the length x in this triangle.



.....
.....
.....

[3 marks]

14 Simplify the following expression:

$$\frac{2a^2bc^3 \times 6a^3b^2c}{4ab^3c^2}$$

.....

[4 marks]

15 a There are 240 pupils in Year 11. Forty-five of them are left-handed.

What is the ratio (in its lowest terms) of left-handed : right-handed pupils in Year 11?

.....
.....

[3 marks]

b When the 210 pupils in Year 10 are included, the ratio of left-handed : right-handed pupils changes to 2 : 7.

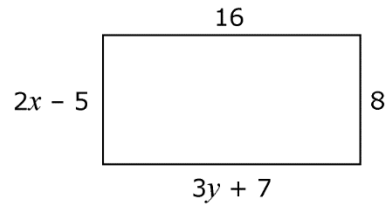
How many left-handed pupils are there in Year 10?

.....
.....

[3 marks]

16 The diagram shows a rectangle.

a Find the value of x .

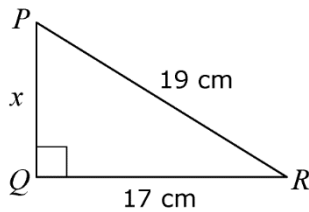


.....
..... [2 marks]

b Find the value of y .

..... [2 marks]

17 Calculate length x in triangle PQR .



.....
.....
..... [3 marks]

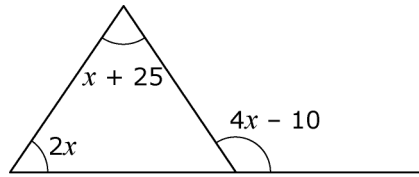
18 Solve these equations:

a $\frac{n}{3} + 8 = 10$

b $\frac{2x - 7}{2} = 6$

.....
.....
..... [3 marks] [3 marks]

19 The diagram shows a triangle, with an exterior angle shown.



Find the value of x .

.....

.....

..... [4 marks]

END OF EXAM – BE SURE TO CHECK YOUR WORK THOROUGHLY