

Name:



OUNDLE

School

Non Common Entrance Examination 2013
Fourth Form Entry

Mathematics

Section A: 30 minutes No calculators allowed

- Write ALL your working and answers on this paper. Show enough working on each question to make it clear how you reached your answer.
Underline your answers.
- Do not spend too long working on any particular question. Do not worry if you do not manage to complete every question in each section.
- You may work in pen or pencil.

Section A NO CALCULATORS

1. Work out:

(a) $6.91 + 39.5$

(b) 68×39

(c) 0.12×0.8

(d) $1169.6 \div 8$

(e) $14 + 8 \div 2 - 2 \times 5$

(f) 84 % of 80

(g) $\frac{7}{12} + \frac{3}{8}$

(h) $4\frac{1}{6} \div 1\frac{2}{3}$

2. If $a = 3$, $b = -5$, and $c = -2$, find the value of the following expressions:
- (a) ab
 - (b) b^2
 - (c) $2a + b - c$
 - (d) $(abc)^2$
3. Simplify these expressions, removing the brackets where appropriate:
- (a) $7(x - 4)$
 - (b) $ab^2c \times a^2b^3$
 - (c) $\frac{36p^3q^4}{12p^2}$
 - (d) $4 - 3(y - 2)$
4. Factorise these expressions completely:
- (a) $5x - 18x^2$
 - (b) $3y^2 + 15xy$
 - (c) $x^2 - 8x + 15$

5. Find the value of x in the following equations:

(a) $3x + 17 = 50$

(b) $3x + 4(x - 3) = 37$

(c) $2x^2 = 72$

(d) $5x - 4 = 8 - 3x$

(e) $\frac{3.6}{x} = 0.6$

6. Fill in the next three terms of the following sequences:

(a) 4, 7, 10, 13,

(b) 95, 87, 79, 71,

(c) 32, 16, 8, 4,

(d) 2, 3, 5, 7, 11,

(e) Find the n th term for sequence (b) above. Give your answer in terms of n .



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Section B: 30 minutes Calculators allowed

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Section B You may use a calculator for this section.

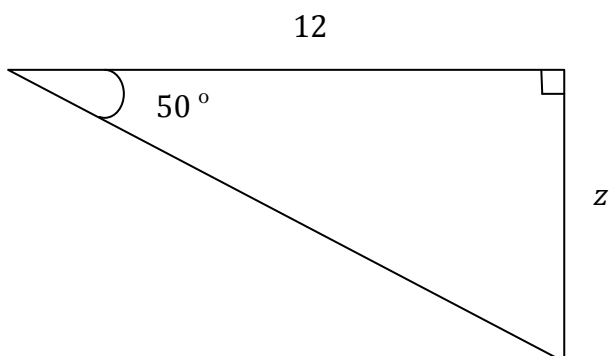
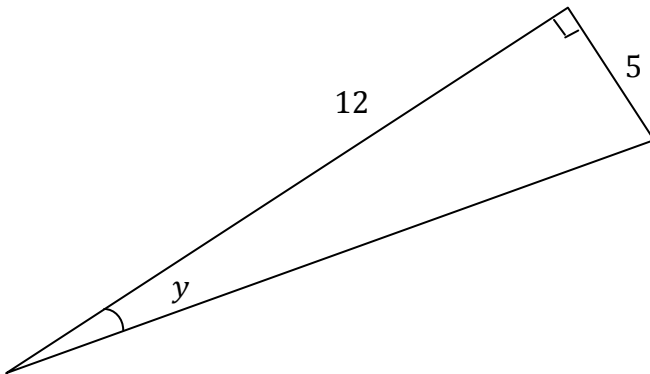
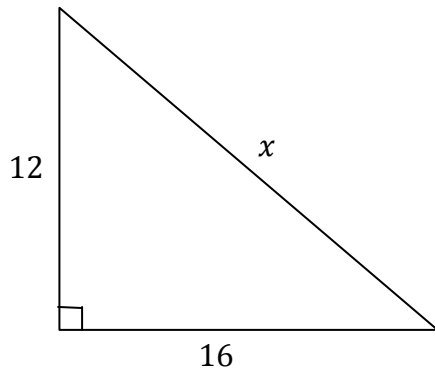
7. A chocolate cake recipe contains several ingredients, including cocoa powder and butter. All the ingredients used together weigh 580g. The ratio of cocoa : butter : other ingredients is 1 : 3 : 16.
- (a) How much butter is in the cake?
- (b) If there is 261g of flour in the cake, what is the ratio of flour to butter?
8. (a) If I score 38 out of 75 in a Chemistry test, what percentage did I score? Give your answer correct to one decimal place.
- (b) Decrease £820 by 12.5%.
- (c) If my weight increased from 67 kg to 71.5 kg, what is the percentage increase? Give your answer correct to one decimal place.
- (d) The height of my dog has increased by 15% over the last year and is now 73.6 cm. What was its height a year ago?

9. A model car travels 1.8 km in 36 minutes.

(a) How long would it take to travel 1 km?

(b) What is its speed in metres per second?

10. In the following triangles find the values of x , y and z .



11. If m and n are prime numbers, and

$$m^2n^3 = 108$$

Find the values of m and n .

12. A factorial (which has a symbol !) can be defined as follows:

$$6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$10! = 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

Work out the following:

(a) $5!$

(b) $6! - 5!$

(c) $\frac{8!}{6!}$

(d) $\frac{100!}{99!2!}$

(e) $\frac{(x+1)!}{x!}$

THE END