

SEVENOAKS SCHOOL



YEAR 9 (13+) SCHOLARSHIP February 2013 for entry in September 2013

MATHEMATICS 1

Your Name: _____

Your School: _____

Time allowed: 1 hour

Equipment needed: Pen, pencil, lined paper, eraser, calculator.

Information for candidates:

1. Write your name and school on this page.
2. Write your answers on the **separate paper** provided. Please put your name on all the sheets of paper you use.
3. There are **12** questions in this paper. Attempt all of them.
4. The marks for each question or part question are indicated in square brackets []. There are **90** marks on the paper.
5. Give your answers to 3 significant figures unless told otherwise.

1. a) Solve the following equations:

(i) $4x + 3 = 15$ [2 marks]

(ii) $5(3x - 2) = 20$ [2 marks]

(iii) $\frac{1}{4}(3x + 1) = 4$ [2 marks]

b) Multiply out:

(i) $2(p - 2)$ [1 mark]

(ii) $2x(3x - 1)$ [1 mark]

(iii) $3a(3a + 2b)$ [1 mark]

2. Showing your working, evaluate:

a) $\frac{3}{4} + \frac{5}{12}$ [2 marks]

b) $1\frac{5}{14} + \frac{6}{7}$ [3 marks]

c) $2\frac{1}{3} - 1\frac{5}{6}$ [3 marks]

d) $\frac{2\frac{1}{3} - 3\frac{1}{4} \div 1\frac{1}{3}}{1\frac{2}{7} \times 3\frac{1}{2}}$ [5 marks]

3. A letter is selected at random from the word SENNOCKIAN. What is the probability that it will be:

a) the letter C? [1 mark]

b) the letter N? [1 mark]

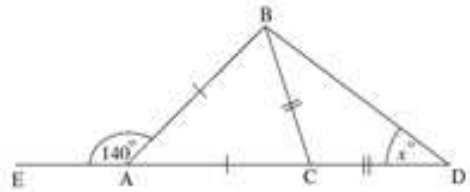
c) the letter U? [1 mark]

d) a vowel? [2 marks]

e) a consonant? [2 marks]

4. a) Estimate $\frac{372.4 - 21.8}{\sqrt{98.7 \times 5.1}}$ [3 marks]
- b) Using your calculator, evaluate this expression
- (i) to 2 decimal places [2 marks]
- (ii) to 5 significant figures [2 marks]
5. In the Jones family, each girl has the same number of brothers as she has sisters. Also each of the boys has twice as many sisters as he has brothers. How many children are there in the Jones family? [5 marks]
6. Three angles in a triangle are $(2n - 20)^\circ$, $(3n + 20)^\circ$ and $(8n - 80)^\circ$
- a) Find the value of n [3 marks]
- b) Find the three angles of the triangle [3 marks]
- c) What sort of triangle is this? [2 marks]
7. The minute hand of a clock is 7.5 cm long. Calculate how far the tip of this hand travels in one week, giving your answer to the nearest cm. [5 marks]
8. The mean weight of 6 Year 11 students is 56 kg. The mean weight of 10 sixth form rugby players is 100 kg. Calculate the mean weight of all 16 people. [5 marks]
9. A triangle has sides x , $2x - 3$ and $3x - 5$
Find the three values of x for which the triangle is isosceles. [6 marks]
10. Find the angle between the hour and minute hand of a clock at each of the following times:
- a) Six o'clock [1 mark]
- b) Four o'clock [2 marks]
- c) Half past six [3 marks]
- d) Twenty past seven [3 marks]

11. In the diagram above, $AB = AC$ and $BC = CD$.
 Angle $EAB = 140^\circ$.
 Find the value of x giving reasons.



[5 marks]

12. Every year the value of a car depreciates by 15%. I buy a car for £20,000
- a) How much is it worth after 1 year? [2 mark]
 - b) How much is it worth after 2 years? [2 mark]
 - c) How much is it worth after 5 years? [3 marks]
 - d) How many whole years does it take until it is worth less than £1000? [4 marks]