SEVENOAKS SCHOOL

YEAR 9 (13+) ENTRANCE EXAMINATION

April 2016
for entry in September 2017

MATHEMATICS

Your Name: _____

Your School: _____

Time allowed: 1 hour

Equipment needed: Pen, pencil, eraser, ruler.

Information for candidates:

1. Calculators are NOT allowed.
2. Write your name and school on this page.
3. Write your answers on the question paper in the space provided.
4. There are 18 questions in this paper, try to answer all of them, but don't worry if you don't complete the paper. If you get stuck, just go on to the next question and if you have time at the end come back to the one(s) you left.
5. There are 50 marks in total available for this paper. Marks for each question are shown in square brackets [ ] after the question.
6. Show all your working. You may be awarded marks for correct working even if your final answer is incorrect, and a correct answer unsupported by correct working may not receive full marks.

1. The Williams family went into a cafe. The table shows what they ordered.

	Cost
Three cans of cola at 89p each	
Two cups of tea at 52p each	
Five buns at 33p each	
Total cost	

a) Complete the table. [4 marks]

b) Mrs Williams paid the bill with a £10 note. How much change did she get?

_____ [1 mark]

2. A group of students went to a fast food restaurant.

a) $\frac{2}{5}$ of them bought a beef burger and $\frac{1}{3}$ of them bought a chicken burger. The rest of them just bought drinks. What fraction of the group just bought drinks?

_____ [2 marks]

b) $\frac{3}{4}$ of those who bought a beef burger also bought chips. What fraction of the whole group bought a beef burger and chips?

_____ [1 mark]

3. a) Calculate 16% of 350.

_____ [1 mark]

b) Calculate 0.25% of 4000.

_____ [1 mark]

4. Natasha and Andy are given some money in the ratio 5:3.

a) If Andy receives £24, how much does Natasha receive?

_____ [2 marks]

b) If the total amount of money given is £40, how much does Andy receive?

_____ [1 mark]

5. a) Write 52.434 correct to 2 decimal places. _____ [1 mark]

b) Write 0.007 correct to 2 decimal places. _____ [1 mark]

c) Write 6.315 correct to 2 significant figures. _____ [1 mark]

d) Write 385.28 correct to 2 significant figures. _____ [1 mark]

6. Given the sequence: 4, 11, 18, 25, 32, …

a) Find the formula for u_n, the nth term.

_____ [2 marks]

b) Hence, or otherwise, find the 12th term in the sequence.

_____ [1 mark]

7. Solve:

a) $\frac{x}{2} - 1 = 4$

_____ [1 mark]

b) $4x - 7 = 9$

_____ [1 mark]

c) $8(2 + 3x) = 4$

_____ [2 marks]

d) $5(3x + 5) = 2(7x - 4)$

_____ [2 marks]

8. The sum of three consecutive numbers is 120.

a) If x is the smallest of the three numbers, write down the equation that x satisfies.

_____ [1 mark]

b) Hence solve for x.

_____ [1 mark]

9. The length of each side of an equilateral triangle is $(x + 5)$ centimeters. The perimeter of the equilateral triangle is 22.5cm. Work out the value of x.

_____ [2 marks]

10. A man was 26 years old when his son was born. Now, he is three times as old as his son. How old is the son now?

_____ [2 marks]

11. What number must be added to 100 and to 20 (the same number to each) so that the sums are in the ratio 3:1?

_____ [2 marks]

12. After nine games, the mean number of goals scored by a football team is 3. If, after one more game,

a) they score five more goals, what is the new mean?

_____ [2 marks]

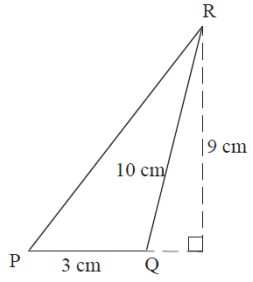
b) they score no extra goals, what is the new mean?

_____ [1 mark]

c) the new mean is 2.9, how many goals did they scored in this game?

_____ [2 marks]

13. Find the area of the shape below.

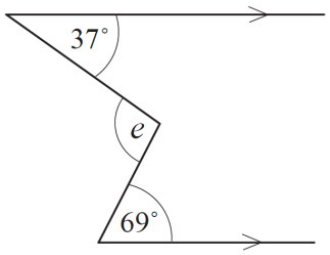


_____ [1 mark]

14. Write one million millimetres in kilometres.

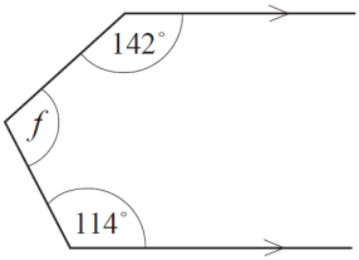
_____ [1 mark]

15. a) Find the size of the angle marked with the letter e.



e =_____ [1 mark]

b) Find the size of the angle marked with the letter f.

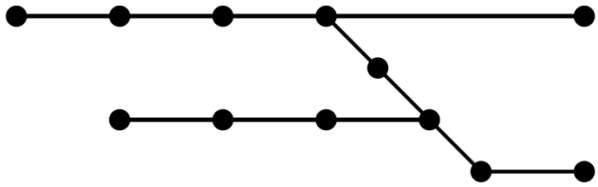


f =_____ [1 mark]

16. The White Rabbit has an appointment to see the Red Queen at 4pm every day of the week except weekends. On Monday he arrives 16 minutes late. Each day after that he hurries more and more and so manages to halve the amount of time that he arrives late by each day. On what day of the week does he arrive just 15 seconds late?

_____ [2 marks]

17. The diagram below is a 'map' of Jo's local rail network, where the dots represent stations and the lines are routes. Jo wants to visit all the stations, travelling only by train, starting at any station and ending at any station, with no restriction on which routes are taken.



a) What is the smallest number of stations that Jo must go to more than once?

_____ [1 mark]

b) Circle the station(s) that she must go to more than once on the diagram. [1 mark]

c) Label the station at which Jo should start her journey, A, and the station at which she will finish, B. [1 mark]

18. The diagram shows a trapezium made from three equilateral triangles. Three copies of the trapezium are placed together, without gaps or overlaps and so that only complete edges coincide, to form a polygon with N sides.



How many different values of N are possible?

_____ [2 marks]

Total: [50 marks]