SEVENOAKS SCHOOL

YEAR 9 (13+) ENTRANCE EXAMINATION

SAMPLE PAPER

MATHEMATICS

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 working and answers on the exam paper.
3. Try to answer all questions, but don't worry if you cannot complete all of them. If you are stuck on a question just go on to the next one and, if you have time left at the end, come back to any that you left.
4. There are 100 marks in total available for this paper.
   The marks for each question or part question are shown in square brackets [ ].
5. Show all your working. You may be awarded marks for correct working eve if your final answer is incorrect.

1. Without using your calculator, showing your working clearly, evaluate the following:

   (a) $(^{-}15)-(^{-}13)+(^{-}12)$

   (b) $0.45 \div 0.09$

   (c) $12\frac{1}{2}\%\ of\quad £360$

   (d) 83×217

   (e) $\frac{4}{5} \times 3\frac{2}{3}$

   (f) $75\%\quad of\quad 0.83\,km$.

   [2, 2, 2, 3, 3, 3]

2. Solve:

   (i) $5x + 2 = 37$ [2]

   (ii) $2w + 18 = 5w - 3$ [3]

   (iii) $\frac{3y}{7} + 4 = 5$ [3]

   (iv) $6(x-5) - 4(x-6) = 0$ [3]

3. Write down the next two terms of these sequences:

   (a) 5, 12, 19, 26, ..., ... [2]

   (b) 32, 16, 8, ..., ... [2]

   (c) $\frac{3}{4}, \frac{5}{6}, \frac{7}{8}, ...$ [2]

4. The number 325 is equal to a square number multiplied by a prime number.
a) What are these two numbers?

b) Find a number between 100 and 200 which is also equal to a square number multiplied by a prime number.

[4]

5. Simplify the following algebraic expressions:

(a) $12x \times 4y$ [2]

(b) $(8y)^2 - 4y^2$ [2]

(c) $8x - 3x + 15 - 2x + 2$ [2]

(d) $\dfrac{15y^2 + 5y^2}{5y}$ [2]

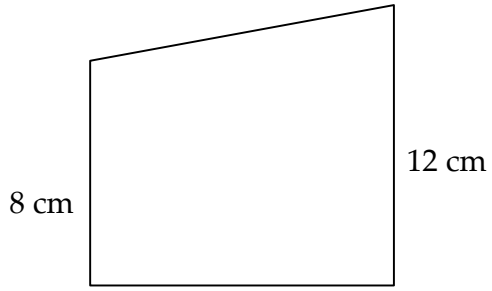
(e) $2(x+1) - (x+3)$ [2]

6. Estimate the following, showing the values used to arrive at your estimate.

(a) $\dfrac{33.1 \times 18.2}{5.8}$ [2]

(b) 0.027×274 [2]

7. Find the area of this shape, giving the correct unit, and name it.



[4]

8. At Christmas, Ben, Sam and Tom received cards in the ration 2 : 3 : 12.
If Tom received 60 cards.

(a) What fraction of the cards did Ben receive? [2]

(b) What fraction did Ben and Sam receive between them? [2]

(c) How many cards did Sam receive? [3]

(d) How many cards did they receive altogether? [3, 1]

9. If $a = 2.8\times10^5$ and $b = 1.6\times10^6$
find **without using your calculator** (and hence showing all your working)
the value of

(i) $a+b$ and (ii) $a\times b$,

giving your answers in standard form correct to 2 significant figures:

[3, 3]

10. On graph paper draw a set of axes with values of x from -6 to +6 and y from -8 to +8.

i) draw the graph of y = $3x$ – 2, use a table with these 3 values.

x	0	1	3
y			

ii) draw the graph of y = 2 – x use a table with these values

x	0	1	3
y			

[8]

iii) What are the coordinates of the intersection of these two lines?

[2]

iv) draw the line x = 4 and hence find the area of the triangle between the lines x = 4, y = $3x$ – 2 and y = 2 - x

[3]

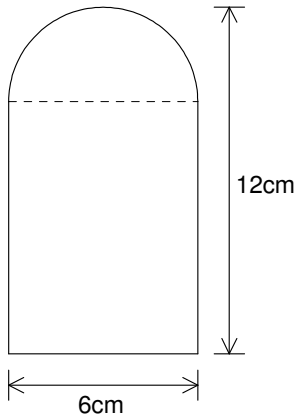
v) What is the gradient of the line y = $5x$ – 4?

[1]

Where does this line cross the y axis ?

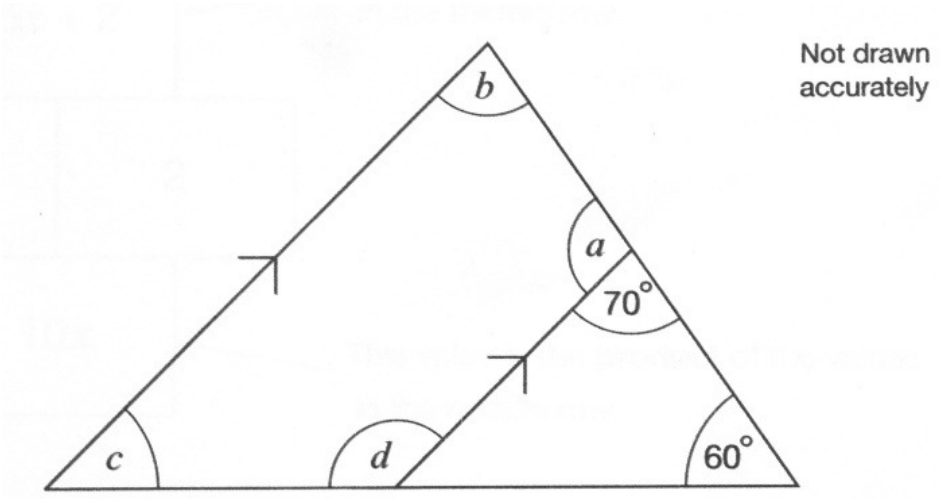
[1]

11. The shape opposite is a semicircle on top of a rectangle.
Find its area using the π button on you Calculator, give your final answer correct to the nearest cm^2:



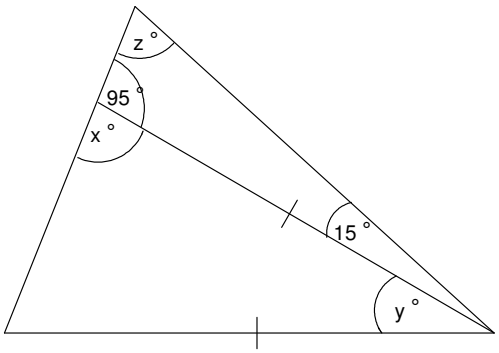
[4]

12. The lines marked with arrows are parallel.



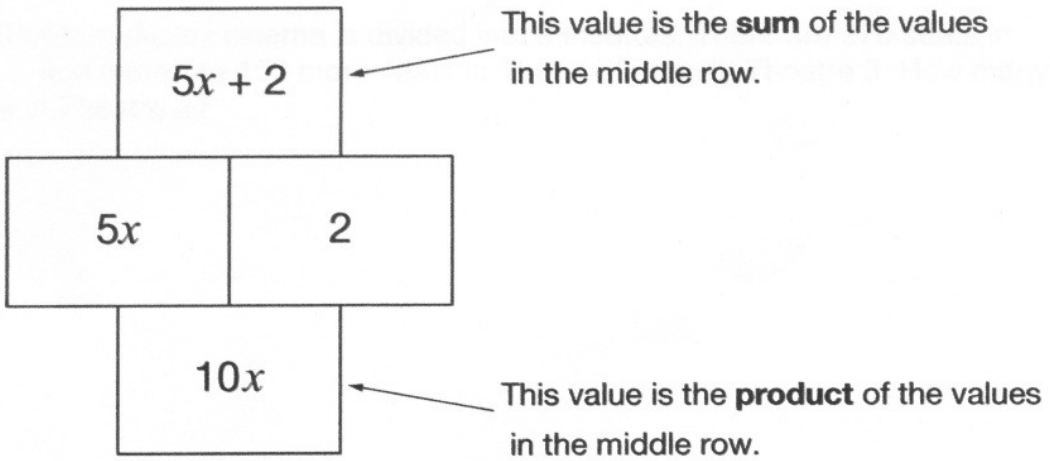
(i) Calculate the size of the angles lettered a, b c and d:

[2, 2, 2, 2]



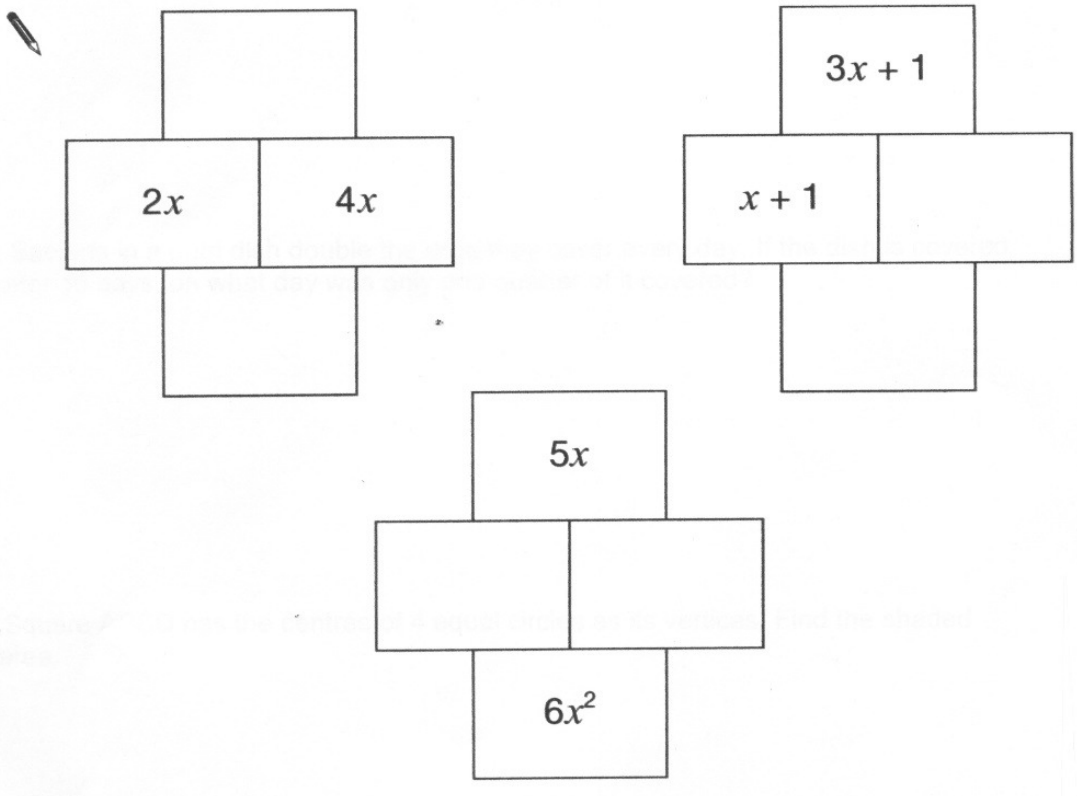
(ii) Calculate the size of the angles x, y and z: [2, 2, 2]

13. Here are the rules for an algebra grid.



Use these rules to copy and complete the algebra grids below.

Write your expressions as simply as possible. (7)

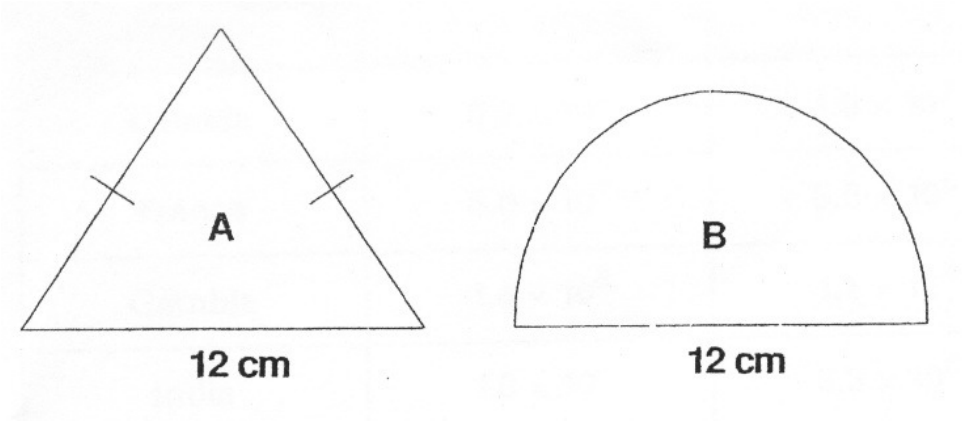


14. A spinner had the numbers 1 to 4 on it.

The probability of spinning a number 4 is 0.1
The probability of spinning a number 1 is 0.6
The probability of spinning a number 2 is the same as the probability of spinning a number 3

Calculate the probability of spinning a **number 3** [3]

15 The diagram below shows an isosceles triangle (A) and a semicircle (B). The triangle has a base of length 12cm and the semicircle has diameter 12cm.



Find the area of A if A and B have the same perimeter. [6]

END OF PAPER: IF YOU HAVE TIME, GO BACK AND CHECK YOUR WORK