SEVENOAKS SCHOOL

YEAR 9 (13+) ENTRANCE EXAMINATION

SAMPLE PAPER

MATHEMATICS

Your Name: ……

Your School: ……..

Time allowed: 1 hour

Equipment needed: Pen, pencil, eraser, ruler, 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 80 marks in total available for this paper. The marks for each question or part question are shown in square brackets [ ] after the question.
5. Show all your working. You may be awarded marks for correct working even if your final answer is incorrect.

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

   a. $\dfrac{(7)-(^{-}5)}{(^{-}3)}$

   Answer:. . . . . [2]

   b. $\dfrac{0.063}{9}$

   Answer:. . . . . [2]

   c. $17\dfrac{1}{2}\%\ of$ £320

   Answer:. . . . . [2]

   d. $\dfrac{3}{8}\times 3\dfrac{1}{5}$

   Answer:. . . . . [2]

   e. $\dfrac{(12-15)^2}{3(5)^2}$

   Answer:. . . . . [2]

2. Solve:

   a. $8x-2=38$

   Answer:. . . . . [3]

b. $2w+10=13w-1$

Answer:. . . . . [3]

c. $\frac{2y}{5}+10=3$

Answer:. . . . . [3]

d. $4(2x-3)-3(x-4)=0$

Answer:. . . . . [3]

e. $\frac{x^2+9}{5}=9$

Answer:. . . . . [3]

3. Simplify the following algebraic expressions:

a. $4x\times 3y$

Answer:. . . . . [1]

b. $(5x)^2-3x^2$

Answer:. . . . . [2]

c. $\frac{18y^2+3y^2}{7y}$

Answer:. . . . . [2]

4.

a. Without using your calculator, estimate $\frac{20.04^2 + 98.4}{97 + \sqrt{10}}$, showing your working clearly.

Answer:. . . . . [3]

b. Use your calculator to find the exact answer and give your result correct to two decimal places:

Answer:. . . . . [2]

5.

a. Each side of a square is increased by 10%.

By what percentage is the area increased?

Answer:. . . . . [2]

b. The length of a rectangle is increased by 20%.

The width is decreased by 20%.

By what percentage is the area changed?

Answer:. . . . . [2]

6. If $a = 6\times10^5$ and $b = 3\times10^4$ Find **without using your calculator** (and hence showing all your working) the value of the following giving your answers in standard form:

   a. $a + 2b$

   Answer:. . . . . [3]

   b. $a \times b$

   Answer:. . . . . [3]

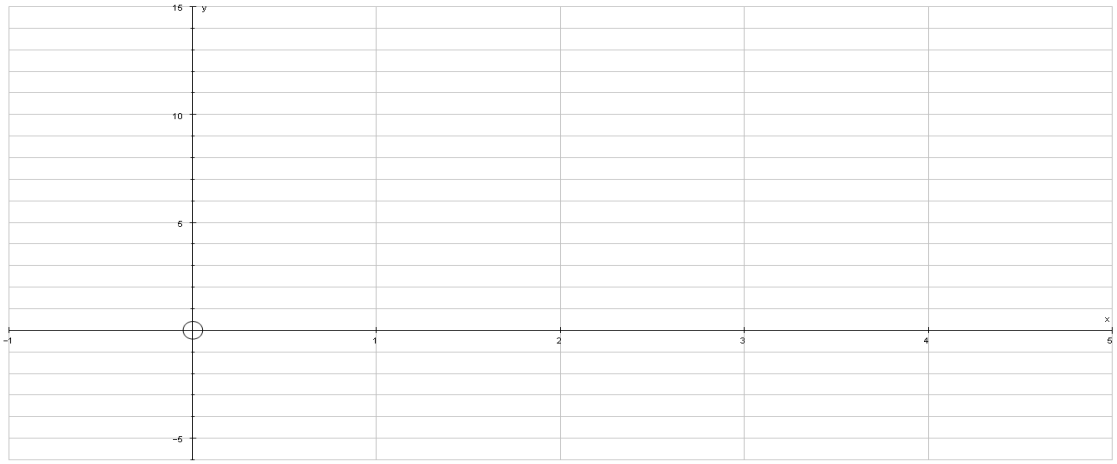
7. Rod, Jane and Freddy entered a quiz. Rod scored 16, Jane scored 6 and Freddy scored 4. They divide the prize money of £169 between them in the same ratio as their scores. How much does Jane receive?

   Answer:. . . . . [4]

8. Copy and complete the table below for the line $y = 5x - 5$

x	0	1	2	3	4
y					

[1]



a. On the axes provided plot the points from your table and complete the graph of $y = 4x - 3$

[1]

b. From your graph estimate where the line intersects the x-axis and write down the coordinates of this point:

Answer:. . . . . [1]

9. The table shows the numbers of Brussels sprouts eaten by twenty-seven pupils on Christmas day.

Number of Sprouts	*Frequency*
4	9
5	6
6	5
7	4
8	2
9	1

a. What is the modal number of sprouts eaten?

Answer:. . . . . [1]

b. What is the mean number of sprouts eaten?

Answer:. . . . . [3]

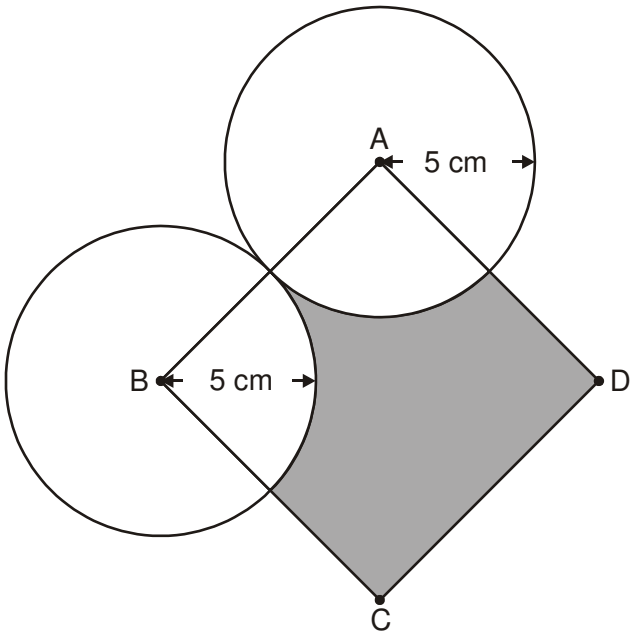
c. What is the range of the data?

Answer:. . . . . [1]

10. The diagram shows two circles and a square, ABCD.

A and B are the centres of the circles.

The radius of each circle is **5 cm**.

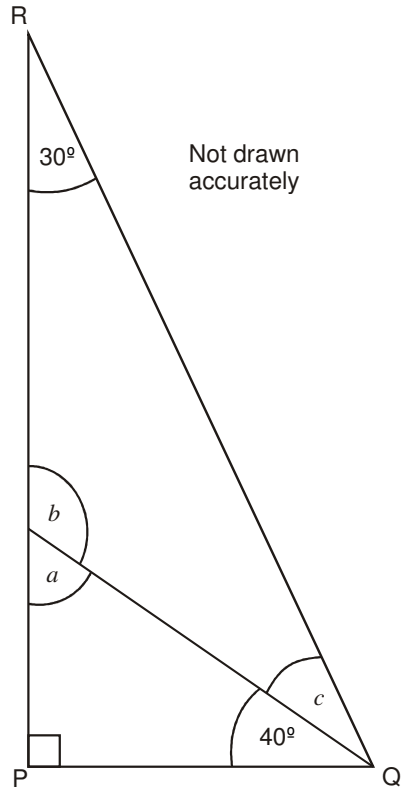


Not drawn accurately

Calculate the area of the **shaded part** of the square.

Answer:. . . . . [3]

11. Calculate the size of the angles lettered *a, b, c*



Answer: a = ... *b* = ... *c* =. . . [3]

12. There are 10 frogs sitting on a wall. 3 of them are green, 5 are red and the rest are blue. One frog jumps off.

    a. What is the probability that the jumping frog was green?

Answer:. . . . . [2]

    b. What is the probability that the jumping frog was either red or blue?

Answer:. . . . . [2]

13. Consider the list of numbers 15, a , 23 , 27 , b, 35. . . where a is the second number in the sequence and b is the fifth number.

a. Write down the values of a and b.

Answer: a = ... b = ... [2]

b. Find an equation for the nth term in the list.

Answer:. . . . . [3]

c. Find the 50^{th} *term* in the list.

Answer:. . . . . [2]

d. Is the term 2 345 a number in the list? Explain your answer.

Answer:. . . . . .

[2]

14. The difference between two numbers is 5.

The difference between the squares of these two numbers is also 5.

a. Use an **algebraic method** to find a pair of numbers for which these statements are true.

..... and .....

[2]

b. Write another pair of numbers for which the statements are also true.

..... and .....

[2]

END OF PAPER

Now go back and check your working.

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