Maths Paper 2015

Year 9 Entrance Exam January 2016

Candidates answer on the question Paper.

Materials required:

- Geometrical instruments
- Tracing paper (optional)

Duration: 1 hour

Candidate Name		Candidate Set	
		Mark	

INSTRUCTIONS TO CANDIDATES

- Write your name in the boxes above. Please write clearly and in capital letters.
- You **must not** use a calculator for any questions in this test.
- Answer **all** questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate name and question number(s).
- **Simplify all fractions to mixed numbers.**

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for Section A is **60** and the total for Section B is **25**. Please complete fully Section A before attempting Section B.

WARNING
No calculator can be used for this paper
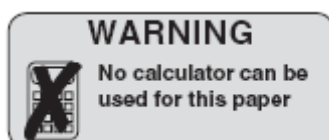
1. Work out.

    (a) 642 + 318

    (a) .... [1]

    (b) 856 − 361

    (b) .... [1]

    (c) 8.43 + 7.2

    (c) .... [1]

    (d) 5.32 × 1000

    (d) .... [1]

    (e) 950.134 ÷ 100

    (e) .... [1]

    (f) 15% of 900

    (f) .... [2]

2.

   (a) Simplify.

     $6p + 5q + 3p - 2q$

     (a) .... **[2]**

   (b) Solve.

     (i) $5a = 15$

     (b)(i) $a =$ .... **[1]**

     (ii) $8b - 6 = 26$

     (ii) $b =$ .... **[2]**

     (iii) $\dfrac{x}{3} + 25 = 29$

     (iii) $x =$ .... **[2]**

3.

   (a) Three angles are drawn below.

   Write down the mathematical name of each type of angle.

....   [3]

   (b) Complete the sentence below.

   19°   Not to scale

   x
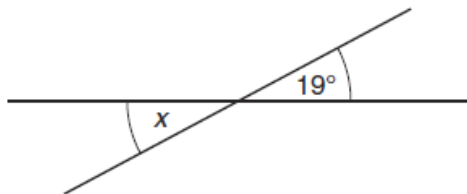
   Angle x is ....° because ....

   .... [2]

4.

  (a) Write down the mathematical name of this quadrilateral.

(a) .... [1]

  (b) Draw the lines of symmetry on this rectangle.

[2]

5.

  (a) What fraction of this shape is shaded?
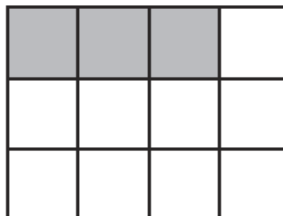
(a) .... [1]
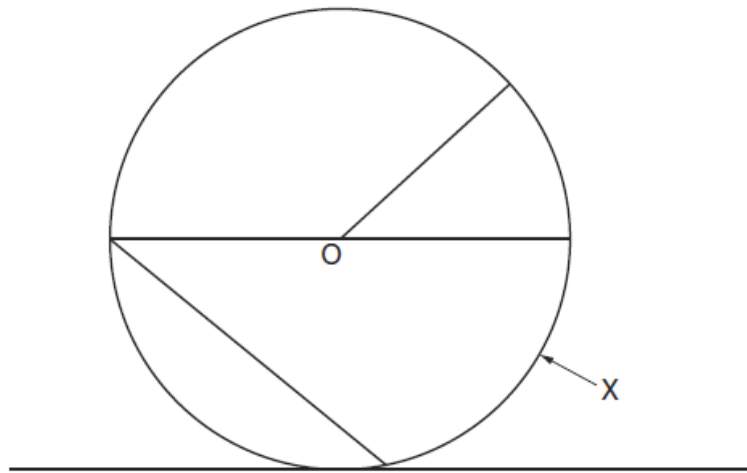
(b) Shade $\frac{2}{3}$ of the rectangle below.
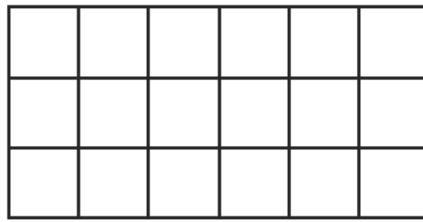
[2]

6.

Here is a circle, centre O.

(a) Measure, in centimetres, the diameter of the circle.

(a) .... cm [2]

(b) Write down the mathematical name of the part of the circle labelled X.

(b) .... [1]

7.

In the diagram ABC is a straight line.
BE = ED.

Work out angle y.
Show all your working.

Not to scale
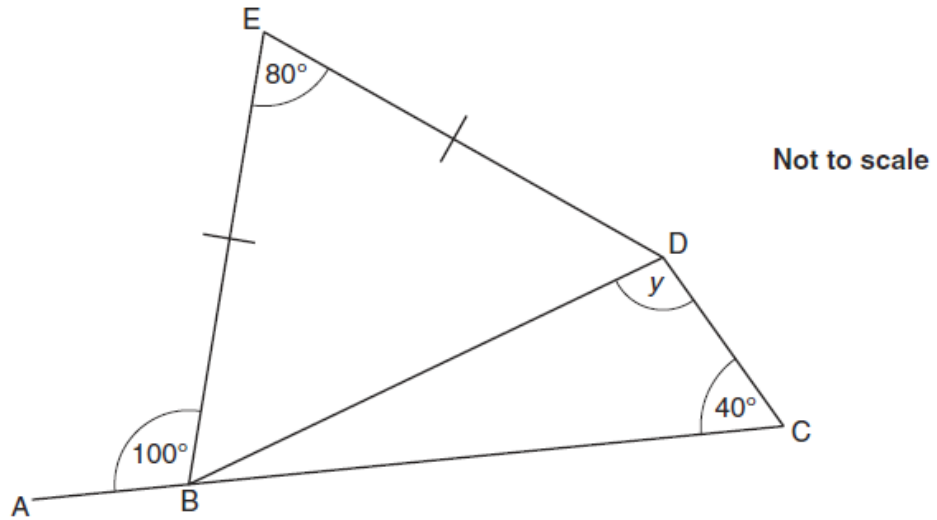
$y =$ ....° **[4]**

8.

(a) Mikhail travelled from Manchester to Moscow.

    (i) He left home at 0820 to travel to the airport.
       He arrived at the airport at 0915.

       How long did his journey take?

       (a)(i) .... minutes [1]

    (ii) Mikhail's flight left at 1305.

       How long did Mikhail have to wait at the airport?

       (ii) .... hours .... minutes [2]

    (iii) When Mikhail left Manchester the temperature was 6°C.
        When Mikhail arrived in Moscow the temperature was 8° colder.

        What was the temperature in Moscow?

        (iii) .... °C [1]

(b) Katy travelled from Manchester to the USA.
    There were 587 passengers on the plane.
    Each passenger paid £827.

    Estimate the amount paid by the passengers in total.

    (b) £ .... [2]

9.

Robert is having a barbecue.

(a) (i) He uses this formula to work out how many burgers to buy.

| multiply the number of people by 2 and add 15 |

How many burgers should Robert buy for 30 people?

(a)(i) .... [2]

(ii) Robert has a joint of pork weighing 6 kg.
He uses this formula to work out for how long he should cook the pork.

$$T = 40w + 25$$

T = time in minutes w = weight in kg

For how long should Robert cook the pork?

(ii) .... minutes [2]

(b) The grill of Robert's barbecue is a rectangle.

2r

h   Not to scale
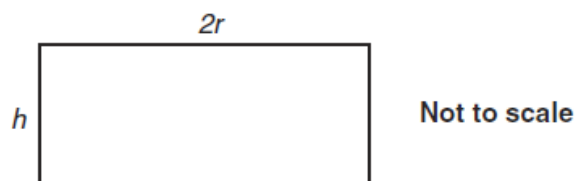
Write a formula for the perimeter, P, of the grill.

(b) .... [2]

10.

Riva Kennels charge £9 per day for each dog.

(a) The cost is reduced to £8.50 if the owners take food for their dogs.
There is a 10% discount off the total bill for 2 or more dogs.

Ruth books her 2 dogs into the kennels for 16 days and takes their food.

How much does she pay altogether?

(a) £ .... [5]

(b) Ruth's 2 dogs each eat $\frac{3}{5}$ of a tin of dog food each day.

What is the least number of tins that Ruth needs to take for 16 days?

(b) .... [4]

11. (a)   Write down the square root of 81.

(a) .... **[1]**

(b) Write 450 as a product of its prime factors.

(b) .... **[2]**

12.

(a) Here are the first four terms of a sequence.

$$3 \qquad 9 \qquad 15 \qquad 21$$

(i) Write down the next term of the sequence.

(a)(i) .... [1]

(ii) Explain how you worked out your answer.

.... [1]

(b) The expression for the nth term for a different sequence is $5n + 2$.

Write down the first three terms of this sequence.

(b) .... [2]

Section B

1.

Bus tickets cost £3.56 each.
Mr Green buys 24 tickets.

Work out the exact cost of 24 tickets.

£ .... [3]

2.

Solve.

$$5x+2=3x-9$$

$x =$ .... [3]

3.

Westbourne Castle is open one weekend each year.
Visitors must book in advance to visit the castle.
This year the number of visitors will be 108 on Saturday and 156 on Sunday.

Visitors are shown round the castle in groups.

- All groups must be the same size on **both** days.
- The number of groups must be as small as possible.

Work out what the group size should be.

.... [3]

4.

    (a) Work out the value of $6a - 5b$ when $a = {}^-2$ and $b = 4$.

                                                          (a) .... [2]

    (b) Multiply out these brackets.

        (i) $4(x - 3)$

                                                    (b)(i) .... [1]

        (ii) $x(x + 5)$

                                                    (ii) .... [1]

    (c) Factorise fully.

        $6x^2 + 4x$

                                                      (c) .... [2]

5.

(a) Work out.

$$\frac{3}{5} \div \frac{2}{3}$$

(a) .... **[2]**

(b) Work out.

$$3\frac{1}{5} + 2\frac{3}{4}$$

Write your answer as a mixed number.

(b) .... **[3]**

6.

Here are the first 5 terms in a sequence.

$$6, 11, 18, 27, 38$$

Write an expression for the nth term of this sequence.

[5]