

Please circle your Maths Teacher's initials: PRN, TJL, RDA, RSB

**KING'S COLLEGE JUNIOR SCHOOL**

**LOWER REMOVES**

**MATHEMATICS EXAM**

**PAPER TWO**

**SUMMER 2010**

**Time: 1 hour**

**Name:** \_\_\_\_\_

**Please read this information before the examination starts**

- All questions should be attempted.
- A \_\_\_\_\_ denotes a space for your answer
- A completely correct answer will receive **no** marks unless you show all your working.
- You may use a calculator.
- Where answers are not exact they should be given to three significant figures, unless specified otherwise.
- If you have time at the end, check your answers carefully.

1) a) i) Writing down all the figures shown on your calculator, find the value of:

$$\frac{2.95 \times 0.98}{3.51 - 1.43}$$

\_\_\_\_\_ (2)

ii) Write your answer to part a) i) correct to 2 decimal places

\_\_\_\_\_ (1)

iii) Write your answer to part a) i) correct to 2 significant figures

\_\_\_\_\_ (1)

b) i) Rewrite the following calculation with each number correct to 1 significant figure.

$$\frac{44.5 + 98.3}{74.8 - 49.3}$$

Answer:

..... + .....

\_\_\_\_\_

..... - ..... (2)

ii) Use your answer to part b) i) to estimate the result of your calculation.

\_\_\_\_\_ (1)

iii) Use your calculator to find the difference between your estimate and the actual result of the calculation.

\_\_\_\_\_ (1)

2) Martin uses 6 litres of petrol to travel 84 kilometres on his motorbike.

If Martin's motorbike uses petrol at a constant rate,

i) how far does he travel on 1 litre of petrol

\_\_\_\_\_ (1)

ii) how many litres would he use to travel 210 kilometres

\_\_\_\_\_ (2)

iii) how many kilometres can he travel on a full tank of 20 litres of fuel?

\_\_\_\_\_ (2)

Petrol costs 77.8 pence per litre.

iv) How much does Martin spend on petrol when travelling 168 km?

\_\_\_\_\_ (2)

3) Simplify the following expressions:

a)  $6a^3 + 2a^3$

\_\_\_\_\_ (1)

b)  $6p^2 + 4pq - p^2 - 7pq$

\_\_\_\_\_ (2)

c)  $2p \times 3pq$

\_\_\_\_\_ (2)

d)  $2a^3b \times 3ab^2$

\_\_\_\_\_ (2)

e)  $\frac{4a}{8a}$

\_\_\_\_\_ (1)

f)  $\frac{9x^6}{12x^2}$

\_\_\_\_\_ (2)

4) Factorise the following completely

a)  $6a^2 + 4a$

\_\_\_\_\_ (2)

b)  $6u^2v - 9u^3v$

\_\_\_\_\_ (2)



5) Multiply out the brackets and simplify

a)  $3s + 2(t - s)$

\_\_\_\_\_ (2)

b)  $3(5x - 2y) - 2(3x - y)$

\_\_\_\_\_ (3)

6) a) The numbers of newspapers and magazines sold by a newsagent are in the ratio 9:2

i) On Monday he sells 153 newspapers.  
How many magazines does he sell?

\_\_\_\_\_ (2)

ii) On Saturday he sells a total of 242 newspapers and magazines.  
How many newspapers does he sell?

\_\_\_\_\_ (2)

b) A map is drawn to a scale of 1:25000  
How many centimetres on the map represent 1 kilometre?

\_\_\_\_\_ (2)

7) Mr Harris bought a painting for £1800.

He then sold it to an antiques shop, making a 35% profit on his buying price.

i) Calculate his selling price.

\_\_\_\_\_ (3)

The painting was later sold by the antiques shop for £3200.

ii) How much profit, in pounds, did the antiques shop make in the sale

\_\_\_\_\_ (1)

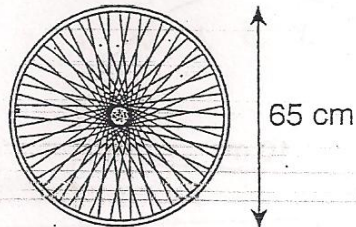
iii) Write this profit as a percentage of the shop's buying price. Write your answer correct to one decimal place.

\_\_\_\_\_ (2)

iv) By what fraction has the painting increased in value since Mr Harris first bought it?

\_\_\_\_\_ (2)

8) My bicycle wheel has a diameter of 65cm.



not to scale

(Using the  $\pi$  button on your calculator)

i) Calculate the circumference of the wheel, correct to the nearest centimetre.

\_\_\_\_\_ (2)

ii) Express your answer to part (i) in metres.

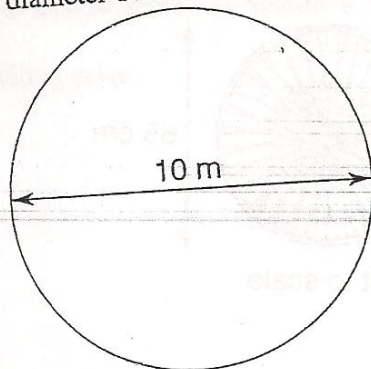
\_\_\_\_\_ (1)

iii) Using your answer in part (ii), calculate how many complete revolutions the wheel would make in travelling 1 kilometre.

\_\_\_\_\_ (2)



9) A circular lawn of diameter 10 metres is to be turfied.



not to scale

(Using the  $\pi$  button on your calculator)

i) Calculate the area of the lawn.

\_\_\_\_\_ (3)

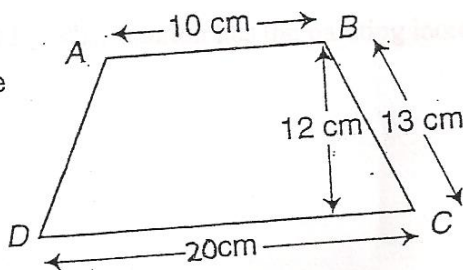
Turf costs £3.50 per square metre.

ii) Find the cost of turfing the lawn, giving your answer to the nearest £5

\_\_\_\_\_ (2)

10) Calculate the area of the trapezium drawn below

not to scale



\_\_\_\_\_ (3)



11) In a French vocabulary test the following marks were recorded for the 20 children in the class.

2, 9, 8, 8, 7, 9, 3, 2, 7, 4, 10, 4, 6, 7, 6, 9, 8, 8, 5, 8

a) Complete the frequency table below

mark achieved	1	2	3	4	5	6	7	8	9	10
number of children	0	2								

(2)

b) State the modal mark

\_\_\_\_\_ (1)

c) Find the median mark

\_\_\_\_\_ (2)

d) Calculate the total number of marks scored by all the children

\_\_\_\_\_ (2)

e) Calculate the mean of the marks.

\_\_\_\_\_ (1)

f) What was the range of the marks achieved?

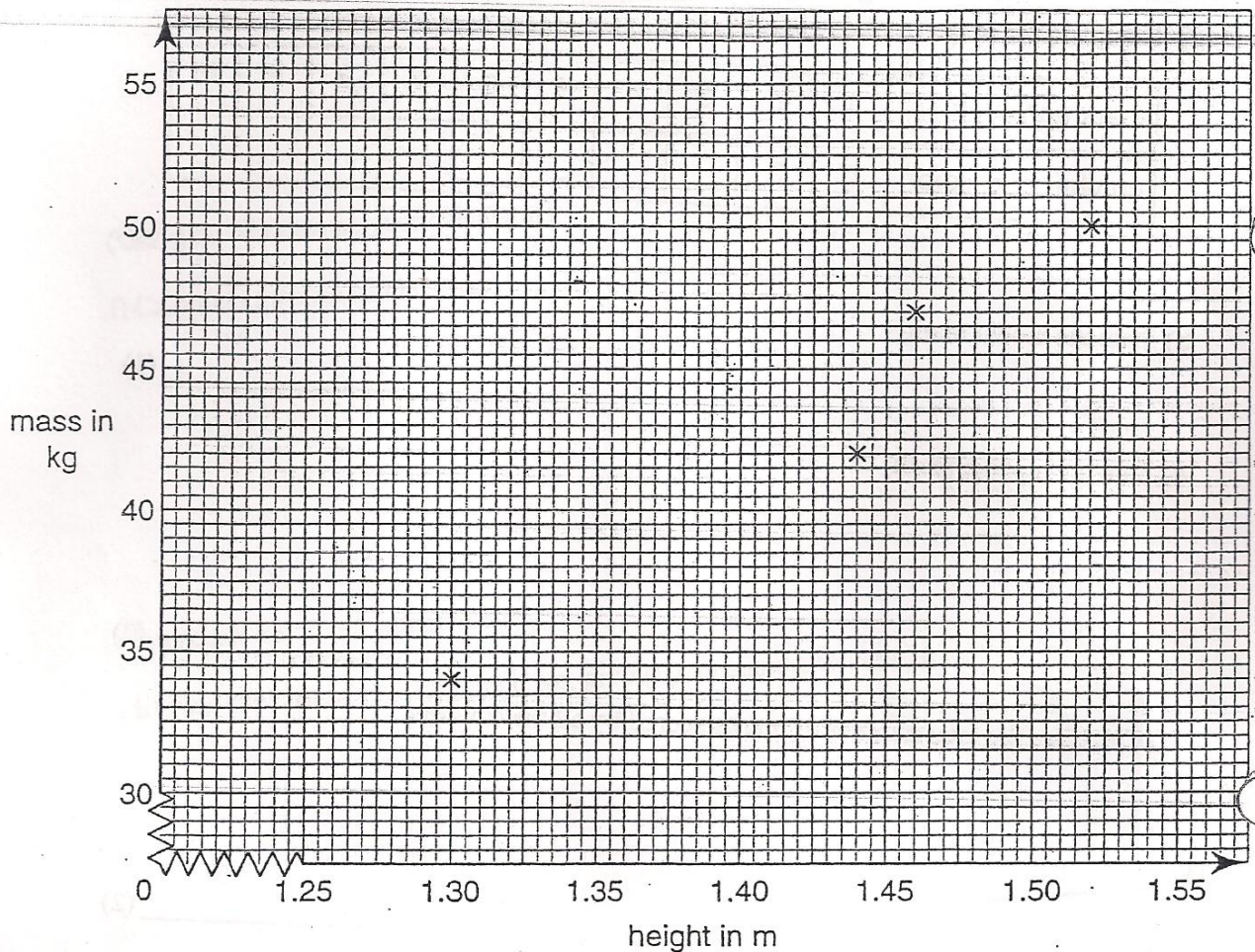
\_\_\_\_\_ (1)



12) 10 children each record their height in metres and their mass in kilograms.

height in m	1.30	1.44	1.46	1.52	1.34	1.28	1.49	1.40	1.42	1.55
mass in kg	34	42	47	50	35	32	48	43	40	52

a) Plot these values on the graph below. The first 4 have been plotted for you. (3)



b) Do the results indicate a positive or negative correlation? \_\_\_\_\_ (1)

c) What is the meaning of the correlation of these results?

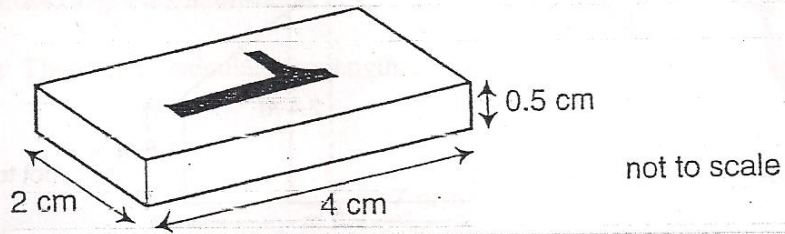
\_\_\_\_\_ (1)

d) On the graph, draw the line of best fit. (1)

e) Use your scatter diagram to estimate the height of a child of mass 38 kilograms. Show clearly where you take your reading.

\_\_\_\_\_ (2)

13) A wooden brick has the measurements shown.

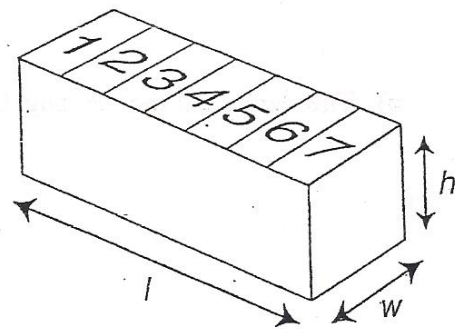


i) Calculate the volume of the brick

\_\_\_\_\_ (2)

There are 28 bricks in a set.  
They pack into an open box, as shown in this sketch.

ii) What are the dimensions of the open box?



length  $l$  = \_\_\_\_\_ cm

width  $w$  = \_\_\_\_\_ cm

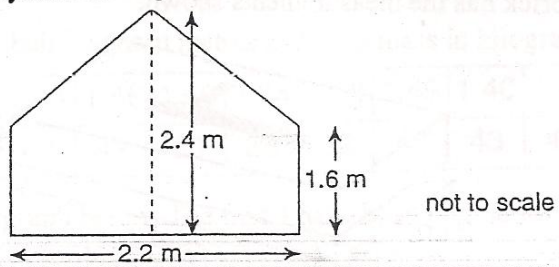
height  $h$  = \_\_\_\_\_ cm  
(3)

iii) Calculate the area of the cardboard needed to make the open box?

\_\_\_\_\_ (2)



14) The cross-section of a symmetrical garden shed is shown in the diagram below.



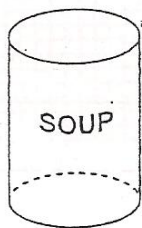
i) Calculate the area of the cross-section.

\_\_\_\_\_ (3)

ii) The shed is 2.5 metres long. Calculate the volume of the shed.

\_\_\_\_\_ (2)

15)



The diagram shows a cylindrical tin of soup with a radius of 4.5cm and a height of 11cm.

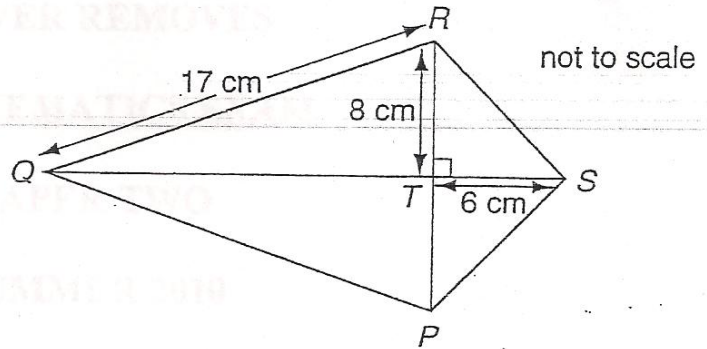
Using the  $\pi$  button on your calculator, calculate the volume of the cylindrical tin.

\_\_\_\_\_ (3)

16) PQRS is a kite whose diagonals intersect at T.

i) Use Pythagoras' Theorem to calculate the length of

a) RS



\_\_\_\_\_ (2)

b) QT.

\_\_\_\_\_ (3)

ii) Calculate the area of the kite PQRS.

\_\_\_\_\_ (2)  
TOTAL MARKS: 100