ST EDWARD'S OXFORD

Department of Mathematics

13+ INTERNATIONAL ENTRANCE EXAM FOR ENTRY IN SEPTEMBER 2010

1 hour

Instructions

- Calculators are permitted.
- All questions should be attempted.
- A row of dots …….. denotes a space for your answer.
- Where answers are not exact they should be given to three significant figures unless otherwise specified.

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1. (a) Use your calculator to work out

$$(2.3 + 1.8)^2 \times 1.07$$

Write down all the figures on your calculator display.

.....

(2)

(b) Put brackets in the expression below so that its value is 45.024

1.6 + 3.8 × 2.4 × 4.2

(1)
(Total 3 marks)

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2. This is a recipe for making Spaghetti Carbonara for **4** people.

Spaghetti Carbonara
Ingredients for **4** people
400 g of spaghetti
120 g of bacon
2 tablespoons of oil
4 eggs
50 g of cheese

Bill is making Spaghetti Carbonara for **6** people.
Work out the amount he needs.

..... g of spaghetti

..... g of bacon

..... tablespoons of oil

..... eggs

..... g of cheese

(Total 3 marks)

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3. Alex and Ben were given a total of £240
They shared the money in the ratio 5 : 7
Work out how much money Ben received.

£ .....

(Total 2 marks)

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4. 20 students scored goals for the school hockey team last month.

The table gives information about the number of goals they scored.

Goals scored	Number of students	
1	9	
2	3	
3	5	
4	3	

(a) Write down the modal number of goals scored.

.....

(1)

(b) Work out the range of the number of goals scored.

.....

(1)

(c) Work out the mean number of goals scored.

.....

(3)

(Total 5 marks)

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5. Mia drove a distance of 343 km.
She took 3 hours 30 minutes.
Work out her average speed.
Give your answer in km/h.

..... km/h

(Total 3 marks)

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6. (a) Simplify

(i) $3g + 5g$

.....

(ii) $2r \times 5p$

.....

(2)

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

.....

(1)

(c) Expand and simplify

$2(3x + 4) - 3(4x - 5)$

.....

(2)

(Total 5 marks)

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7. (a) Solve $3x = 18$

$x =$ .....

(1)

(b) Expand $t(t - 2)$

.....

(1)

(c) Factorise $3y - 12$

.....

(1)

(d) Solve $4w + 5 = w - 7$

$w =$ .....

(3)

(Total 6 marks)

8.

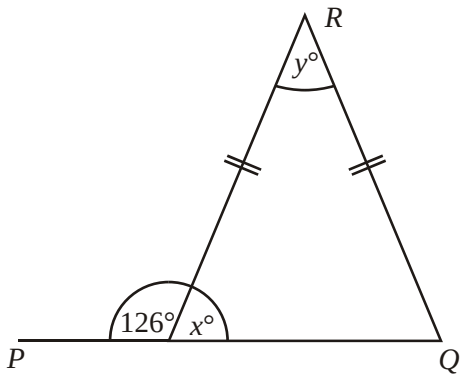

Diagram **NOT** accurately drawn

PQ is a straight line.

(a) Work out the size of the angle marked $x°$.

.....°

(1)

(b) (i) Work out the size of the angle marked $y°$.

.....°

(ii) Give reasons for your answer.

.....

.....

(3)

(Total 4 marks)

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9. In a sale all the normal prices are reduced by 18%.

In the sale Mandy pays £12.71 for a hat.

Calculate the normal price of the hat.

£……..

(Total 3 marks)

10.

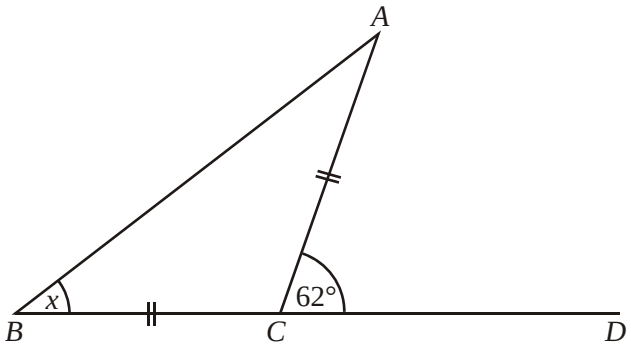

Diagram **NOT** accurately drawn

Triangle *ABC* is isosceles, with *AC* = *BC*.
Angle *ACD* = 62°.
BCD is a straight line.

(a) Work out the size of angle *x*.

x = ……°

(2)

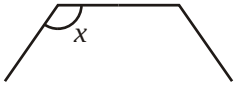

Diagram **NOT** accurately drawn

The diagram shows part of a **regular** octagon.

(b) Work out the size of angle *x*.

x = ……°

(3)

(Total 5 marks)

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10. Wayne bought an engagement ring for Tracy.
The total cost of the ring was £420 **plus** VAT at $17\frac{1}{2}$ %.

(a) Work out the cost of the ring.

£ ……

(2)

Wayne invited 96 people to an engagement party.
Only 60 of the people invited came to the party.

(b) Express 60 as a percentage of 96.

…… %

(2)

(Total 4 marks)

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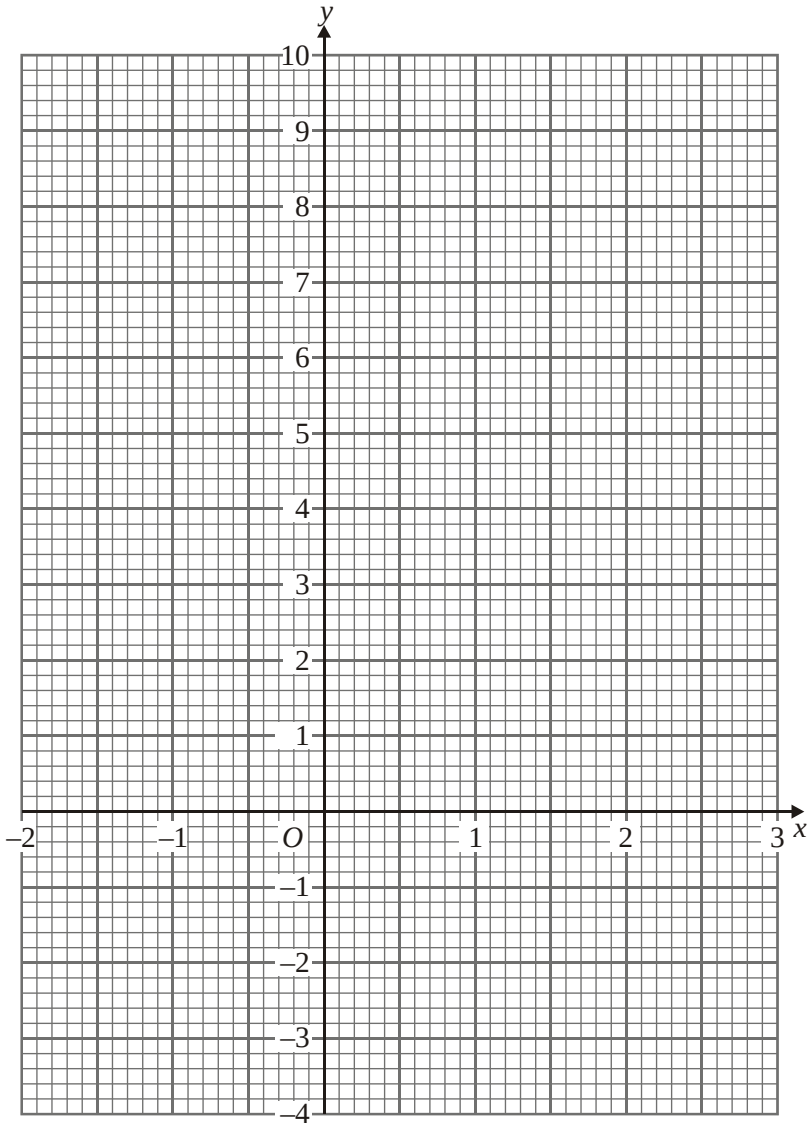
12. (a) Complete the table of values for $y = 2x + 3$

x	–2	–1	0	1	2	
y		1	3			

(2)

(b) On the grid, draw the graph of $y = 2x + 3$



(2)

(c) Use your graph to find

(i) the value of y when $x = –1.3$

$y =$ .....

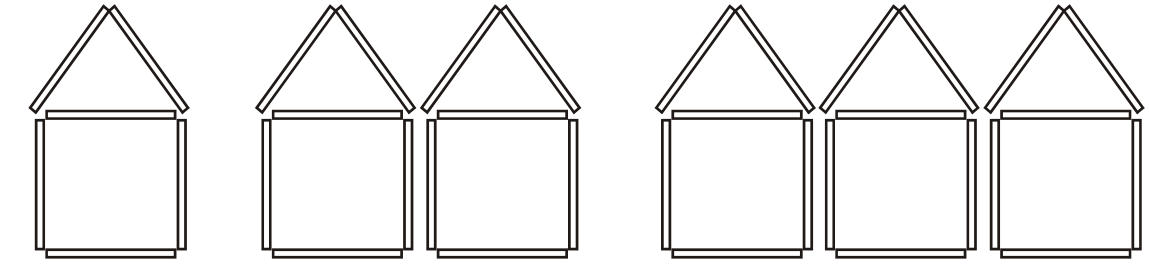
(ii) the value of x when $y = 5.4$

$x =$ .....

(2)

(Total 6 marks)

13. Here are some patterns made from matchsticks.



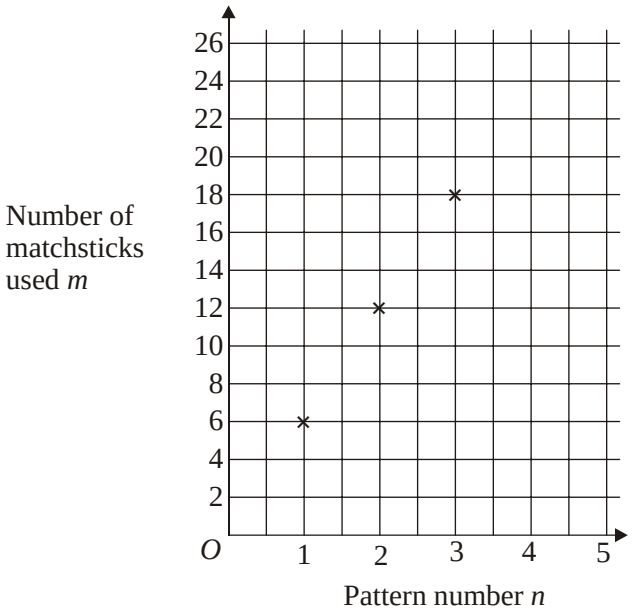
Pattern number 1 Pattern number 2 Pattern number 3

(a) Draw Pattern number 4, in the space below.

(1)

The graph shows the number of matchsticks m in pattern number n.

(b) Mark the point which shows the number of matchsticks used in Pattern number 4.



(1)

(c) How many matchsticks are used in Pattern number 10?

……

(1)

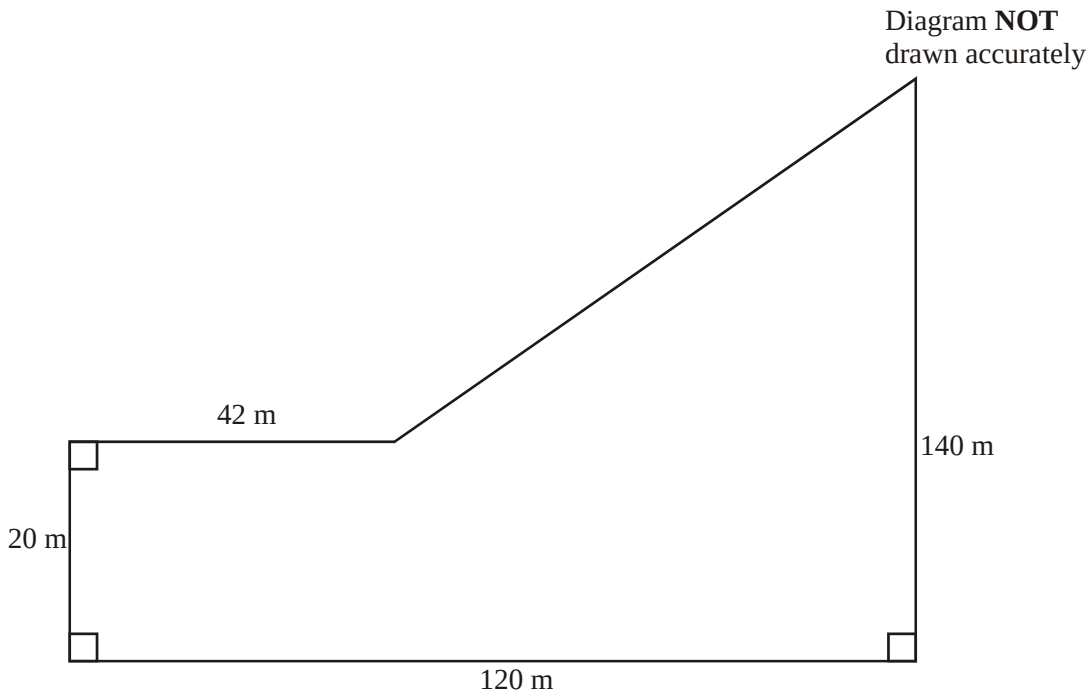
(d) Write down a formula for m in terms of n.

……

(2)

(Total 4 marks)

14.



The diagram shows a car park.
Mrs Roberts is selling the car park. She will accept any offer that is more than £28 per square metre.
Mr Patel offers £194 700 for the car park..
Will Mrs Roberts accept Mr Patel's offer for the car park?
You must show how you reached your decision.

Decision …….

(Total 6 marks)

Bonus mark question (only attempt this question once all other questions have been answered).

15. Assume that Laura races Joe over 100 metres and wins by 10 metres.

With Joe on the start line:

a) If Laura starts 10 metres behind Joe, who will win, and by how much?

b) If Laura starts 11 metres behind Joe, who will win, and by how much?

c) If Laura starts 11.1 metres behind Joe, who will win, and by how much?

d) How far behind Joe does Laura have to start for the race to be a dead-heat?

Answers: ……..

(Total: 10 marks)

End of Exam