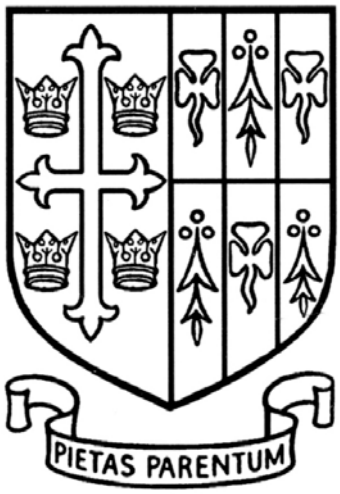
ST EDWARD'S
OXFORD



13+ ENTRANCE EXAMINATION
2011

MATHEMATICS

1 hour

Name: _____

There are 60 marks available.

Calculators are NOT allowed.

Write all answers, including your workings, in this booklet.

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1. You can buy a new calculator for **£1.25**



In 1979 the same type of calculator cost **22 times** as much as it costs now.

How much did the same type of calculator cost in 1979?

Show your working.

£

2 marks

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2. The diagram shows four different sized barrels.

			
Barrel **A** holds **54 gallons**	Barrel **B** holds **36 gallons**	Barrel **C** holds **18 gallons**	Barrel **D** holds **9 gallons**

Write the missing fractions **as simply as possible**. The first one is done for you.

Barrel **C** holds $\frac{1}{2}$ of the amount barrel **B** holds.

Barrel **D** holds ..... of the amount barrel **B** holds.

Barrel **C** holds ..... of the amount barrel **A** holds.

Barrel **B** holds ..... of the amount barrel **A** holds.

3 marks

3. Here is a list of numbers:

−7 −5 −3 −1 0 2 4 6

You can choose some of the numbers from the list and add them to find their **total**.

For example, 6 + −1 = 5

(a) What is the **total** of **all eight** of the numbers on the list?

1 mark

(b) Choose the **three** numbers from the list which have the **lowest possible total**.

Write the three numbers and their total. You must not use the same number more than once.

..... + ... + ... =

2 marks

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4. Complete the statements below.

When x is 8 , $4x$ is ..... 1 mark

When x is ..... , $4x$ is 48 1 mark

When x is 8 , ... is 48 1 mark

---

5. Write each expression in its simplest form.

$7 + 2t + 3t$ .....

1 mark

$b + 7 + 2b + 10$ .....

1 mark

$(3d + 5) + (d - 2)$ .....

1 mark

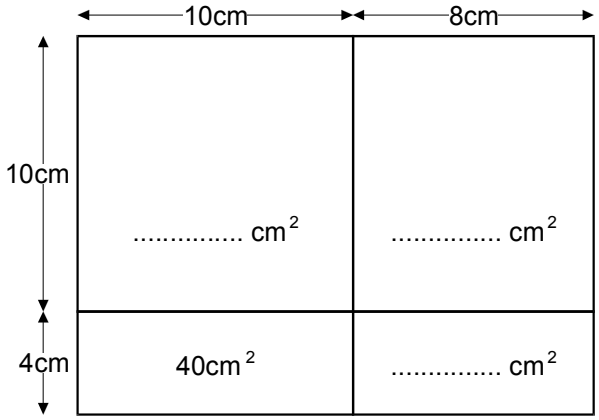
$3m - (- m)$ .....

1 mark

6. (a) The diagram shows a rectangle **18cm** long and **14cm** wide.

It has been split into **four smaller rectangles**.

Write the **area** of each **small rectangle** on the diagram. One has been done for you.



What is the area of the **whole** rectangle?

..... cm^2

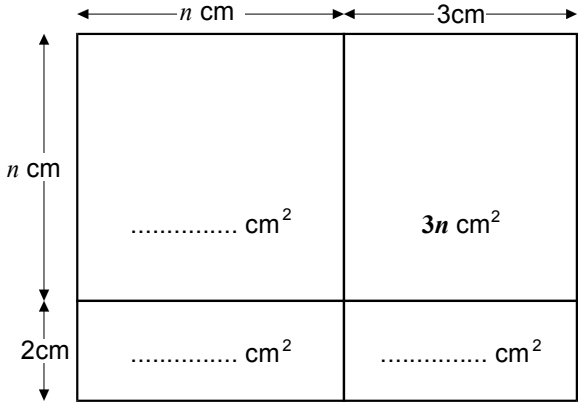
1 mark

(b) The diagram shows a rectangle **(*n* + 3)** cm long and **(*n* + 2)** cm wide.

It has been split into **four smaller rectangles**.

Write a **number** or an **expression** for the **area** of **each small rectangle** on the diagram.

One has been done for you.



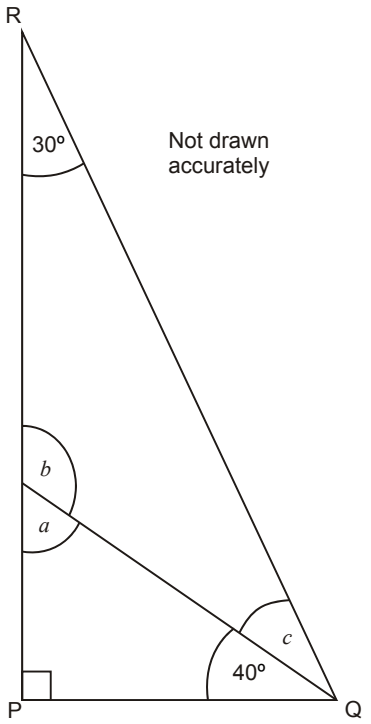
1 mark

What is **(*n* + 3) (*n* + 2)** multiplied out?

$(n + 3)(n + 2) =$ .....

1 mark

7. The diagram shows triangle PQR.



Work out the sizes of angles *a*, *b* and *c*

a = ...° *b* = ...°

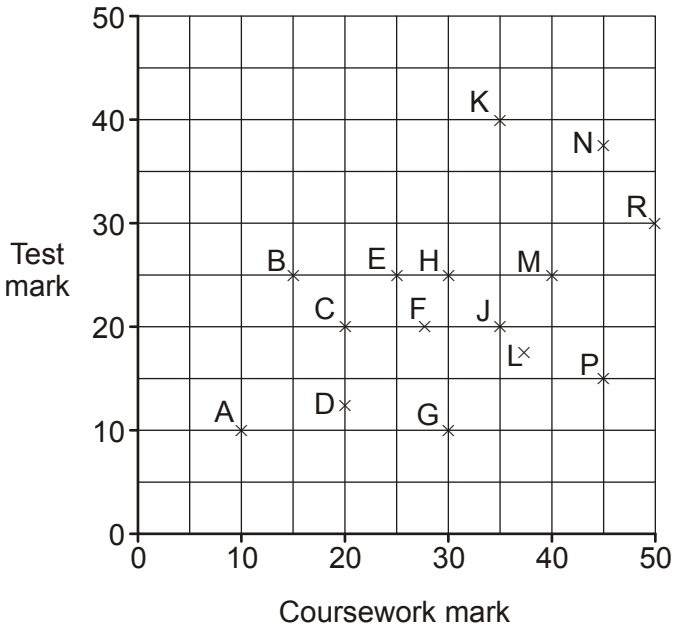
c = ...°

3 marks

---

8. The scatter graph shows 15 pupils' coursework and test marks.

To find a pupil's **total** mark, you add the coursework mark to the test mark.



(a) Which pupil had the highest **total** mark?

.....

1 mark

(b) Look at the statement:

The range of coursework marks was greater than the range of test marks.

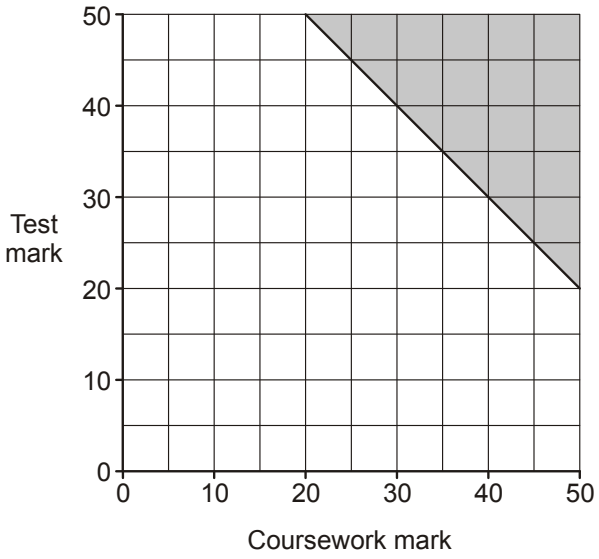
Tick (✓) True or False.

☐ True ☐ False

Explain your answer.

1 mark

(c) Pupils with total marks in the shaded region on the graph win a prize.



What is the **smallest total mark** needed to win a prize? .....

1 mark

9. Mark and Kate each buy a family pack of crisps. Each family pack contains **ten bags** of crisps. The table shows how many bags of each flavour are in each family pack.

flavour	number of bags
Ready salted	5
Salt & vinegar	2
Roast chicken	2
Cheese & onion	1

(a) Mark is going to take a bag of crisps at random from his family pack. Complete these sentences.

The probability that the flavour will be ..... is $\frac{1}{2}$

1 mark

The probability that the flavour will be **cheese & onion** is .....

1 mark

(b) Kate ate **two bags** of **ready salted** crisps from her family pack of 10 bags. Now she is going to take a bag at random from the bags that are left. What is the probability that the flavour will be **cheese & onion**?

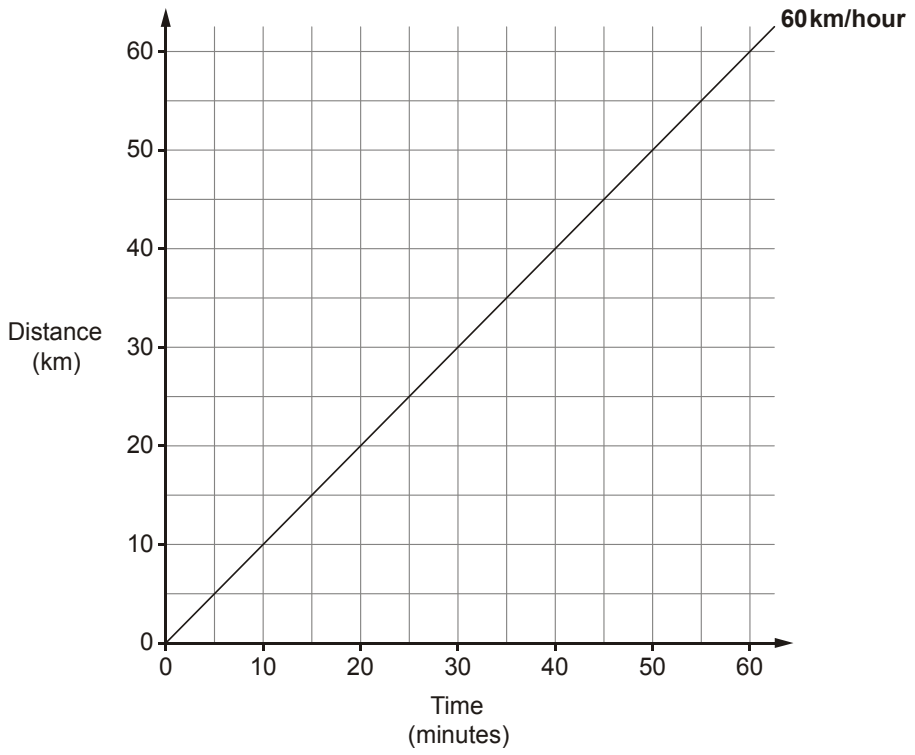
..... 1 mark

(c) A shop sells **12 bags** of crisps in a large pack. I am going to take a bag at random from the large pack. The table below shows the probability of getting each flavour. Use the probabilities to work out **how many bags** of each flavour are in this large pack.

flavour	probability	number of bags
Ready salted	$\frac{7}{12}$	
Salt & vinegar	$\frac{1}{4}$	
Roast chicken	$\frac{1}{6}$	
Cheese & onion	0	

2 marks

10. The line on the graph below represents a speed of 60km/hour.



(a) Draw a line on the graph to represent a speed of **30 km/hour**.

Label the line by writing 30km/hour.

1 mark

(b) Now draw a line on the graph to represent a speed of **120 km/hour**.

Label the line by writing 120km/hour.

1 mark

11. (a) Put these values in order of size with the **smallest first**.

5^2 3^2 3^3 2^4

....
smallest largest

2 marks

(b) Look at this information.

5^5 is 3125

What is 5^7?

.....

3 marks

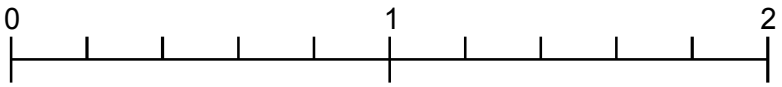
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12. (a) Add $\frac{6}{10}$ and $\frac{6}{5}$

.....

1 mark

Now use an arrow (↓) to show the result on the number line.



1 mark

(b) How many **sixths** are there in $3\frac{1}{3}$?

.....

1 mark

(c) Work out $3\frac{1}{3} \times \frac{4}{5}$

Give your answer as a mixed number. Show your working.

.....

2 marks

---

13. Solve these equations. Show your working.

a) $8k - 1 = 15$

k = ...

1 mark

b) $2m + 5 = 10$

m = ...

1 mark

c) $3t + 4 = t + 13$

t = ...

2 marks

14. The table shows a recipe for a fruit drink.

Type of juice	Amount
Orange	$\frac{1}{2}$ litre
Cranberry	$\frac{1}{3}$ litre
Grape	$\frac{1}{6}$ litre
	Total 1 litre

I want to make **$1\frac{1}{2}$ litres** of the same drink.

Complete the table below to show how much of each type of juice to use.

Show your working.

Type of juice	Amount
Orange	litre
Cranberry	litre
Grape	litre
	Total $1\frac{1}{2}$ litres

2 marks

15. (a) For each sequence below, tick (✓) the correct box to show if it is **increasing**, **decreasing** or **neither**.

				increasing	**decreasing**	**neither**
$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	☐	☐	☐
$\frac{6}{13}$	$\frac{7}{12}$	$\frac{8}{11}$	$\frac{9}{10}$	☐	☐	☐
$\frac{1}{2}$	$\frac{2}{4}$	$\frac{3}{6}$	$\frac{4}{8}$	☐	☐	☐
$\frac{3}{2}$	$\frac{4}{3}$	$\frac{5}{4}$	$\frac{6}{5}$	☐	☐	☐

2 marks

(b) A different sequence has this expression for the nth term:

$$\frac{1}{(n+1)^2}$$

Work out the first four terms in the sequence.

....

1 mark

---

16. (a) Find the values of a and b when $\boldsymbol{p = 10}$

$$a = \frac{3p^3}{2}$$

a = ...

1 mark

$$b = \frac{2p^2(p-3)}{7p}$$

b = ...

1 mark

(b) Simplify this expression as fully as possible:

$$\frac{3cd^2}{5cd}$$

1 mark

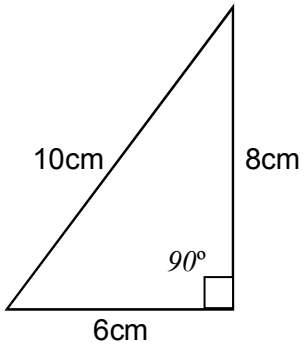
(c) Multiply out and simplify this expression:

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

1 mark

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17. (a) What is the area of this triangle?



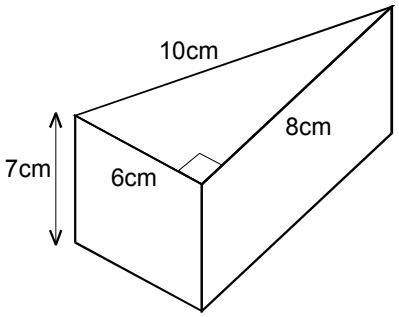
..... cm^2

NOT TO SCALE

1 mark

(b) What is the **volume** of this prism?

You **must** show **each step** in your working.

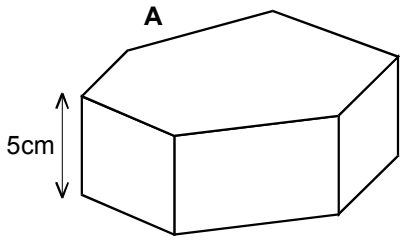


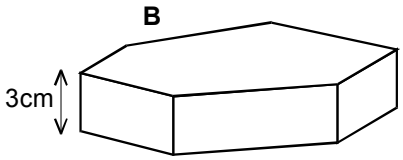
NOT TO SCALE

..... cm^3

2 marks

(c) Prisms A and B have the same cross-sectional area.





NOT TO SCALE

Complete the table:

	Prism A	Prism B
height	**5cm**	**3cm**
volume	**200cm^3**	**..... cm^3**

1 mark

---

18. I have two fair 4-sided dice.

One dice is numbered **2**, **4**, **6** and **8**

The other is numbered **2**, **3**, **4** and **5**

I throw both dice and **add** the scores.

What is the probability that the total is **even**?

You **must** show working to explain your answer.

2 marks

END OF TEST