FOR OFFICIAL USE

X100/101

X1001001 1

Total Mark

NATIONAL QUALIFICATIONS 2011

WEDNESDAY, 18 MAY
1.00 PM – 1.35 PM

MATHEMATICS
INTERMEDIATE 1
Units 1, 2 and 3
Paper 1
(Non-calculator)

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day Month Year

Scottish candidate number

Number of seat

1 **You may NOT use a calculator.**

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Use blue or black ink. Pencil may be used for graphs and diagrams only.

FORMULAE LIST

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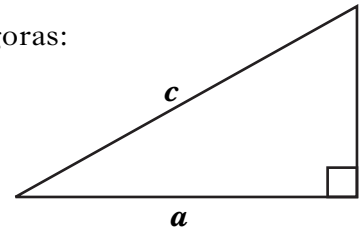
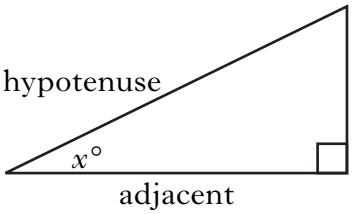
Theorem of Pythagoras:



$a^2 + b^2 = c^2$

Trigonometric ratios in a right angled triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

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DO NOT WRITE IN THIS MARGIN

ALL questions should be attempted.

Marks

1. (*a*) Find 6·47 + 13·9.

1

(*b*) Find $\frac{5}{8}$ of 360.

1

(*c*) Find 12 × 13.

1

[Turn over

Marks

2. An overnight ferry left Lerwick at 1745 and arrived in Aberdeen at 0720 the next morning.

How long did the journey from Lerwick to Aberdeen take?

1

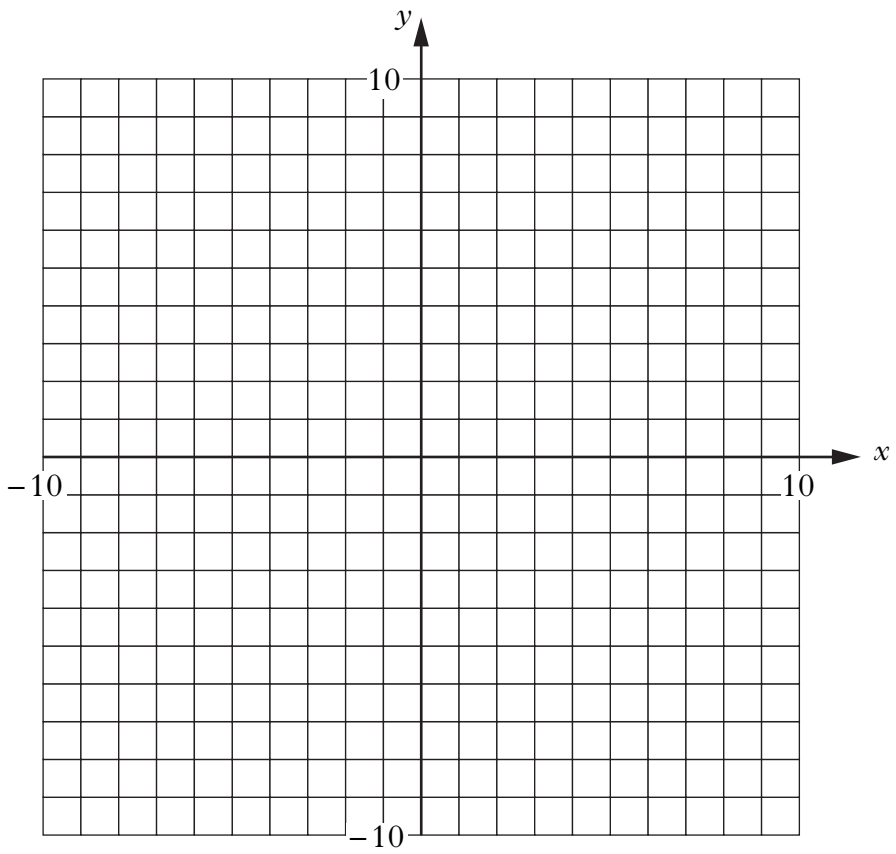
3. Work out the answer to

$$17 - 4 \times (-2).$$

2

Marks

4. (*a*) On the grid below, plot the points P(–7,2) and Q(5,–6).



1

(*b*) Draw a line joining P to Q.

The point R is halfway along this line.

Write down the coordinates of R.

1

[Turn over

Marks

5. The fare charged by a taxi firm is:

> £3 for the first 500 metres of a journey
> plus 50p for **each additional** 500 metres.

(*a*) Find the fare charged for a journey of 1500 metres. **2**

(*b*) The fare charged for another journey is £7.
What distance is the journey? **2**

Marks

6. Solve algebraically the equation

$$7p - 2 = 54 + 3p.$$

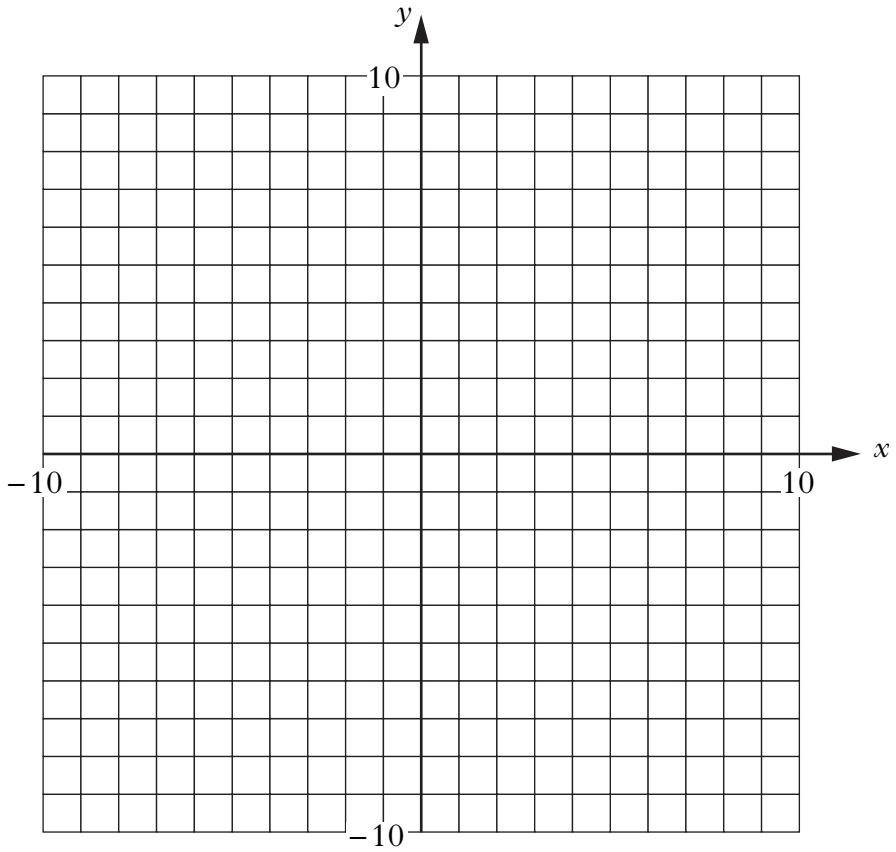
3

7. (*a*) Complete the table below for $y = 3x - 2$.

x	–2	0	3
y			

2

(*b*) Draw the line $y = 3x - 2$ on the grid.



2

[Turn over

Marks

8. Thirty students were given homework.

The frequency table shows the length of time each student spent on the homework.

Time (minutes)	Frequency
5	1
10	6
15	11
20	7
25	5
	Total = 30

(*a*) Write down the modal time spent on the homework.

1

(*b*) What is the probability that a student, picked at random, spent 20 minutes on the homework?

1

(*c*) Complete the table below **and** find the mean time spent on the homework.

Time (minutes)	Frequency	Time × Frequency
5	1	5
10	6	60
15	11	165
20	7	
25	5	
	Total = 30	Total =

3

Marks

9. Margaret has £200 worth of gift vouchers for a jewellery shop. She wants to buy some of the items shown below.

Bracelet	Pendant	Earrings	Bangle	Charm
£105	£80	£55	£50	£30

Margaret wants to buy **three** items.

She can spend a **maximum** of £200.

She does not want to buy more than one of each item.

One combination of **three** items that Margaret can buy is shown in the table below.

Bracelet £105	**Pendant £80**	**Earrings £55**	**Bangle £50**	**Charm £30**	**Total Value (£)**
	✓	✓	✓		185

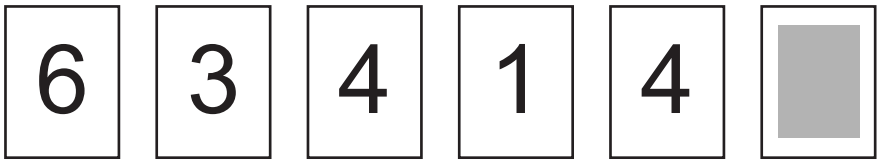
Complete the table to show **all** the possible combinations of items that Margaret can buy. **3**

[Turn over for Question 10 on *Page ten*

Marks

10. Each card in a pile has a number printed on it.

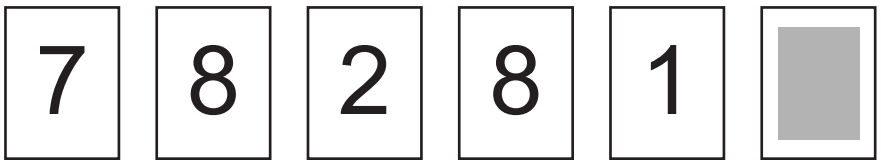
(*a*) Seonaid selects these six cards from the pile.
The number on the last card is hidden.



The range of the numbers on the **six** cards is 8.
Find the hidden number.

1

(*b*) Kirsty selects these six cards from the pile.
The number on the last card is hidden.



The mean of the numbers on the **six** cards is 5.
Find the hidden number.

2

[*END OF QUESTION PAPER*]

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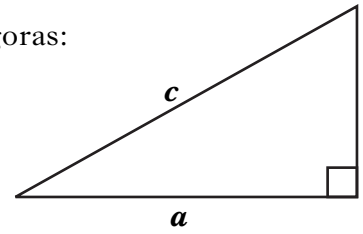

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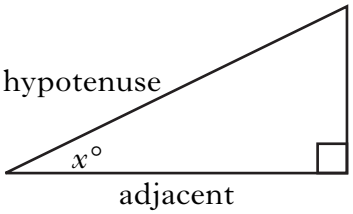

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Marks

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1. Sohail burns off 160 calories when he runs for 20 minutes.
For how many minutes would he need to run to burn off 400 calories?

2

2. Solve algebraically the inequality

$$7c + 13 < 55.$$

2

[Turn over

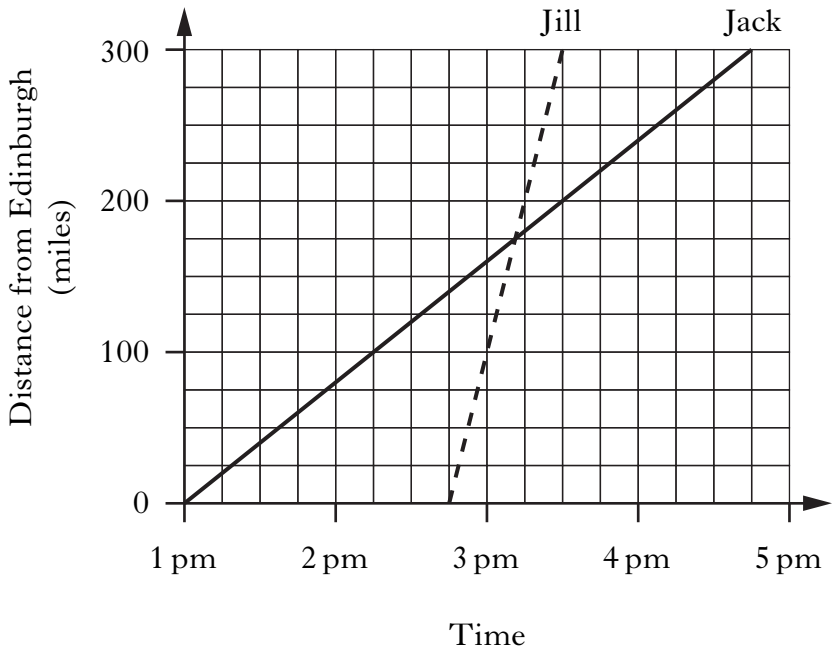
Marks

3. A factory produces 4000 widescreen televisions each valued at £950.
Calculate the total value of the 4000 televisions.
Give your answer in standard form.

3

Marks

4. Jack and Jill travel from Edinburgh to Birmingham.
Jack travels by train and Jill travels by aeroplane.
The graph below shows their journeys.



(*a*) How much sooner than Jack does Jill arrive in Birmingham?

1

(*b*) Calculate the average speed, in miles per hour, of Jack's journey.

3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

5. (*a*) Multiply out the brackets and simplify

$$5(2m + 7) - m.$$

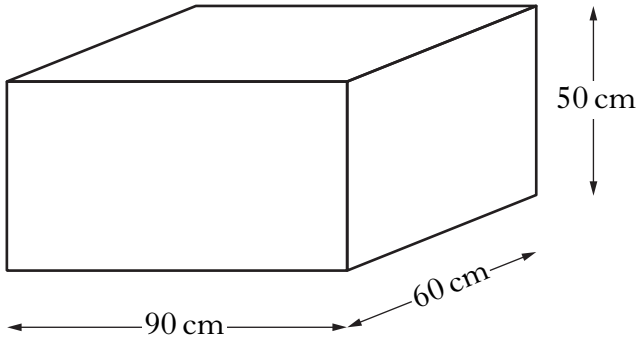
2

(*b*) Factorise $24 - 18k$.

2

Marks

6. This empty tank is to be filled with water.



The tank is a cuboid, 90 centimetres long, 60 centimetres wide and 50 centimetres high.

The water fills at a rate of 15 litres every minute. (1 litre = 1000 cm^3)

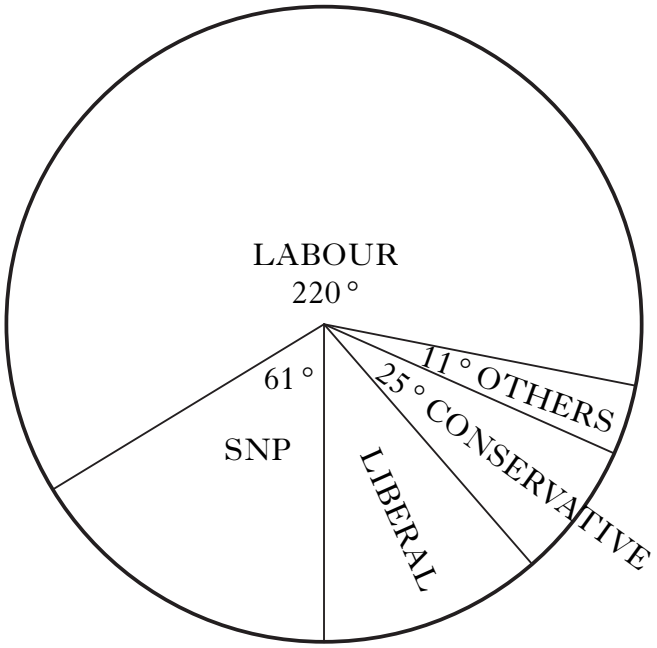
How long will it take to fill the tank?

4

[Turn over

Marks

7. The pie chart shows the share of the votes received by candidates in the Gleniston constituency at the general election in 2005.

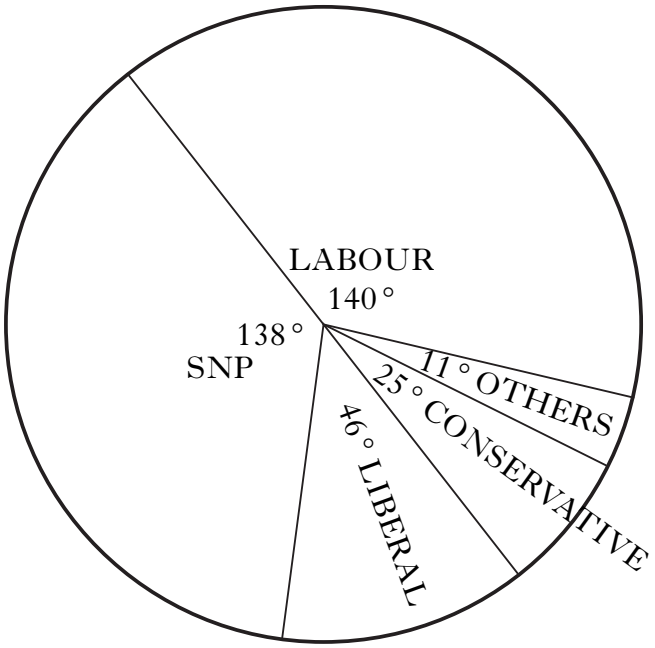


(*a*) A total of 30 960 people voted in the Gleniston constituency. How many people voted for the Liberal candidate? **3**

Marks

7. (continued)

The pie chart below shows the share of the votes received by candidates in the Gleniston constituency at the by-election in 2008.



(*b*) Describe the **differences** in the share of the votes received by candidates in the by-election in 2008 and the general election in 2005. **2**

[Turn over

Marks

8. Last year Mark rented a villa in Spain in April and October.

In April the villa cost him £800.

In October it cost the same number of **euros** as it did in April.

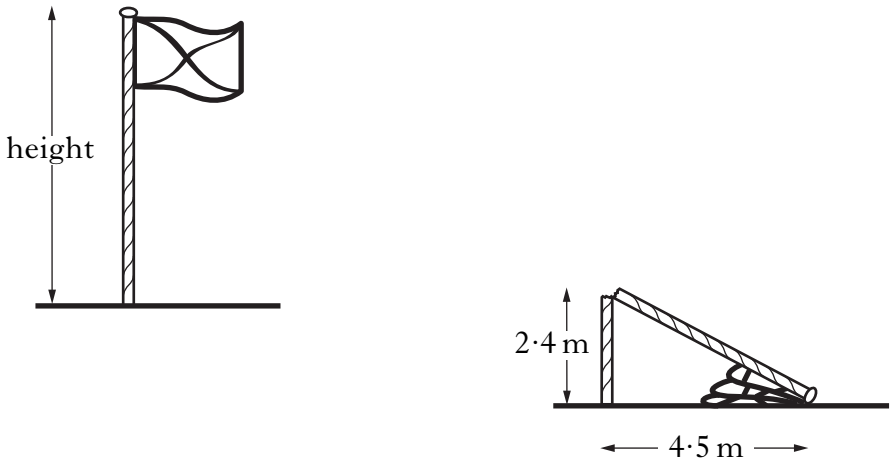
How much, in pounds and pence, did Mark pay in October?

Exchange Rates	
April	£1 = €1·33
October	£1 = €1·07

3

Marks

9. A flagpole snaps and falls over into the position shown.



Calculate the height of the flagpole before it fell over.

Do not use a scale drawing.

4

[Turn over

Marks

10. Joe borrows £1400 from a bank.

The rate of interest is 7·5% per annum.

Calculate the interest he must pay after four months.

3

11. Use the formula below to find the value of P when $m = 360$ and $t = 0{\cdot}45$.

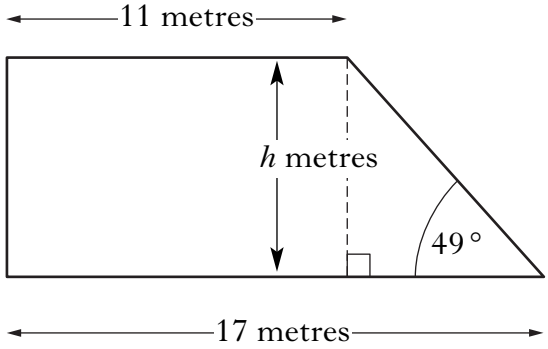
$$P = \sqrt{\frac{m}{2t}}$$

3

Marks

12. Calculate the height, h metres, of the trapezium shown below.

Do not use a scale drawing.



4

[Turn over

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Marks

13. Alysoun bought a mobile phone for £125.

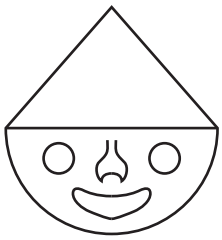
She sold it a few months later for £80.

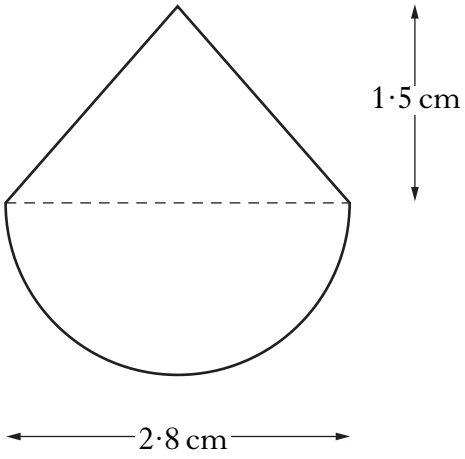
Calculate her loss as a percentage of what she paid for the phone.

4

Marks

14. A badge showing a clown's head consists of a semi-circle and a triangle.





Calculate the area of the badge in square centimetres.

Give your answer correct to one decimal place.

5

[*END OF QUESTION PAPER*]

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