FOR OFFICIAL USE

Total mark

X101/102

NATIONAL QUALIFICATIONS 2002

MONDAY, 27 MAY
1.00 PM – 1.35 PM

MATHEMATICS INTERMEDIATE 1

Units 1, 2 and Applications of Mathematics 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.**

2 Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.

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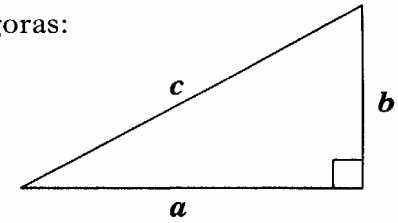
LIB X101/102 6/7470

FORMULAE LIST

Circumference of a circle: $C = \pi d$
Area of a circle: $A = \pi r^2$
Curved surface area of a cylinder: $A = 2\pi rh$

Theorem of Pythagoras:



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

DO NOT WRITE IN THIS MARGIN

ALL questions should be attempted.

Marks

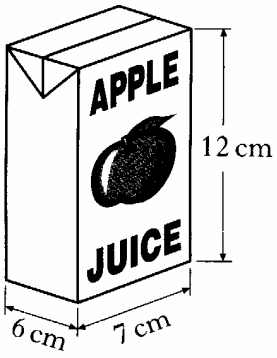
1. (*a*) Find $5{\cdot}22 \div 9$.

1

(*b*) Find $\frac{2}{5}$ of £80.

1

2. Find the volume of this cuboid.

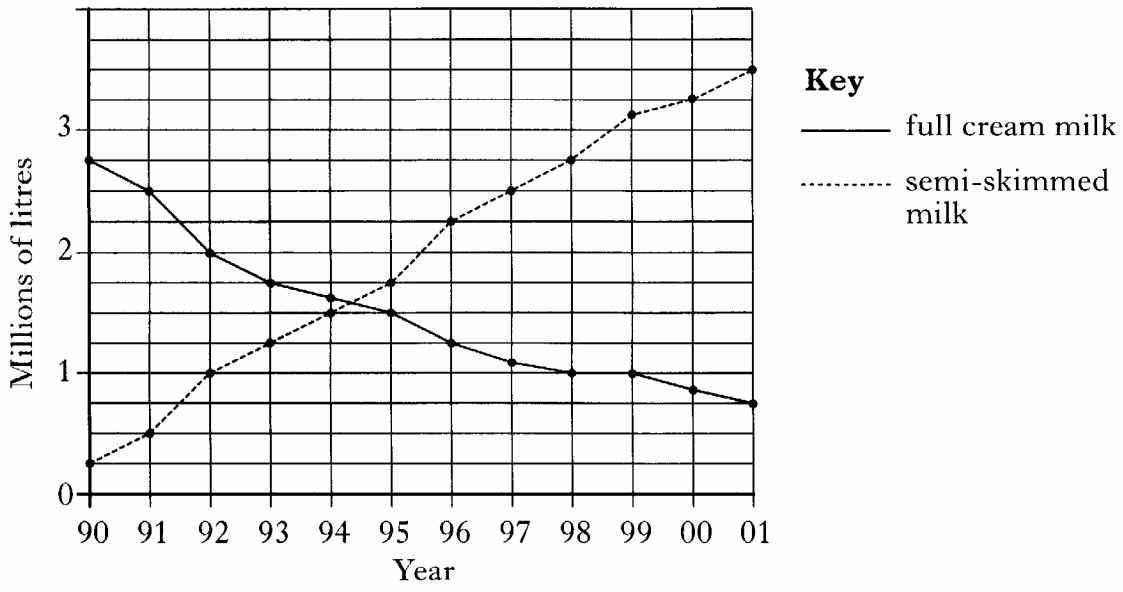


2

[Turn over

Marks

3. The graph shows the amount of full cream and semi-skimmed milk sold by a supermarket from 1990 to 2001.



(*a*) How much semi-skimmed milk was sold in 1991?

1

(*b*) Describe the trend in sales of **both** kinds of milk.

1

Marks

4. This information appears on a box of chocolates.

Nutritional Information

per 100 grams

Energy	489 kJ
Protein	6·28 g
Carbohydrate	57·1 g
Fat	25·6 g

How much fat is in 300 grams of the chocolates?

2

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

5. Geeta is buying a new car. Her local garage has the following special offer on new cars.

Choose any THREE of these items up to a maximum value of £850

CD player	*£150*
Air Conditioning	*£300*
One year's Insurance	*£400*
Central Locking	*£200*
Electric Sunroof	*£350*

(*a*) One combination of items is shown in the table below.

CD player	*Air Conditioning*	*One year's Insurance*	*Central Locking*	*Electric Sunroof*	*Total Value*
✓		✓	✓		£750

Complete the table to show **all** the possible combinations of items available under this special offer. **3**

(*b*) Geeta wants all five of these items.
She is willing to pay for the extra two items.
What is the least amount she must pay? **2**

Marks

6. Sam works in a shop. He is paid £5 an hour. He works 36 hours a week. Complete his payslip below.

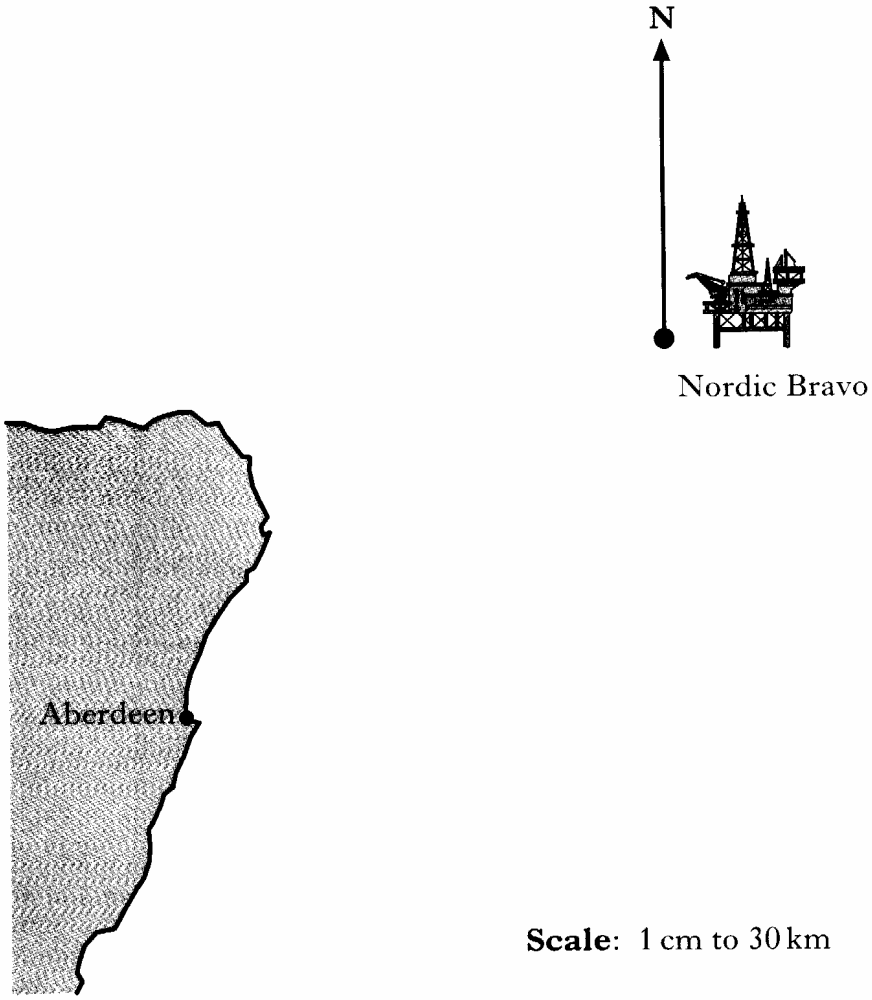
Name: Sam MacDonald		**Week ending:** 18/5/02
Hours worked 36	**Hourly rate** £5·00	**Gross pay**
Tax £16·91	**National Insurance** £10·40	**Total Deductions**
		Net Pay

3

[Turn over

Marks

7. The scale drawing shows the positions of Aberdeen and the oilrig Nordic Bravo.



Scale: 1 cm to 30 km

Use the scale drawing to find the distance and bearing of Aberdeen **from Nordic Bravo**.

4

DO NOT WRITE IN THIS MARGIN

Marks

8. The full premium for John to insure his car last year was £480.
This year the premium has increased by one third.
John also receives a 20% discount on **this year's** premium.
How much will John pay to insure his car this year?

4

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

9. The attendances at six football matches are listed below.

7000 10 000 64 000 11 000 10 000 12 000

(*a*) Find the mean attendance.

2

(*b*) Find the median attendance.

2

(*c*) Which of the averages gives a truer picture of the above attendances — the mean or the median?

Give a reason for your answer.

1

DO NOT WRITE IN THIS MARGIN

Marks

10. Evaluate $3ab - c$ when $a = -1$, $b = 2$ and $c = -10$.

3

[END OF QUESTION PAPER]

FOR OFFICIAL USE

Total marks

X101/104

NATIONAL QUALIFICATIONS 2002

MONDAY, 27 MAY
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MATHEMATICS INTERMEDIATE 1

Units 1, 2 and Applications of Mathematics Paper 2

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LIB X101/104 6/7470

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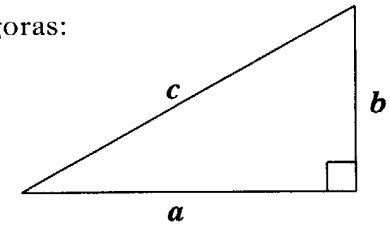


$a^2 + b^2 = c^2$

Marks

ALL questions should be attempted.

1. A letter is chosen at random from the letters of the word

MATHEMATICS.

What is the probability that the chosen letter is **M**?

1

2. The table below shows the **monthly repayments** to be made when money is borrowed from the Inverness Building Society.

	Monthly Repayments		
Loan \ *Term*	*20 years*	*25 years*	*30 years*
£20 000	£158·64	£146·39	£136·98
£30 000	£239·26	£217·70	£206·12
£40 000	£320·03	£290·89	£273·73

Katy needs to borrow **£30 000** to buy a flat.

(*a*) She decides to repay the loan over **30 years**.

(i) How much will she pay each month?

1

(ii) How much will she pay altogether?

2

(*b*) How much would Katy have saved if she had borrowed the £30 000 over **20 years**?

2

DO NOT WRITE IN THIS MARGIN

Marks

3. The number of copies of "The Anglers Weekly" magazine sold by a newsagent was recorded for 16 weeks.

25	23	19	22	18	45	38	23
32	25	51	27	23	30	28	42

(*a*) Complete this stem and leaf diagram using the data above.

1	
2	
3	
4	
5	

1|8 represents 18 magazines

2

(*b*) Find the mode for this data set.

1

DO NOT WRITE IN THIS MARGIN

Marks

4. Jane is going to Switzerland and wants to change £500 into Swiss francs. Two travel agents offer the following exchange rates.

TRAVELSUN	**SOLLAIR**
£1 = 2·46 Swiss francs	**£1 = 2·50 Swiss francs**
No commission	**2% commission payable**

(*a*) How many Swiss francs would Jane receive from Travelsun for £500?

1

(*b*) Which travel agent will give Jane more Swiss francs for her £500?
Show clearly all your working.

4

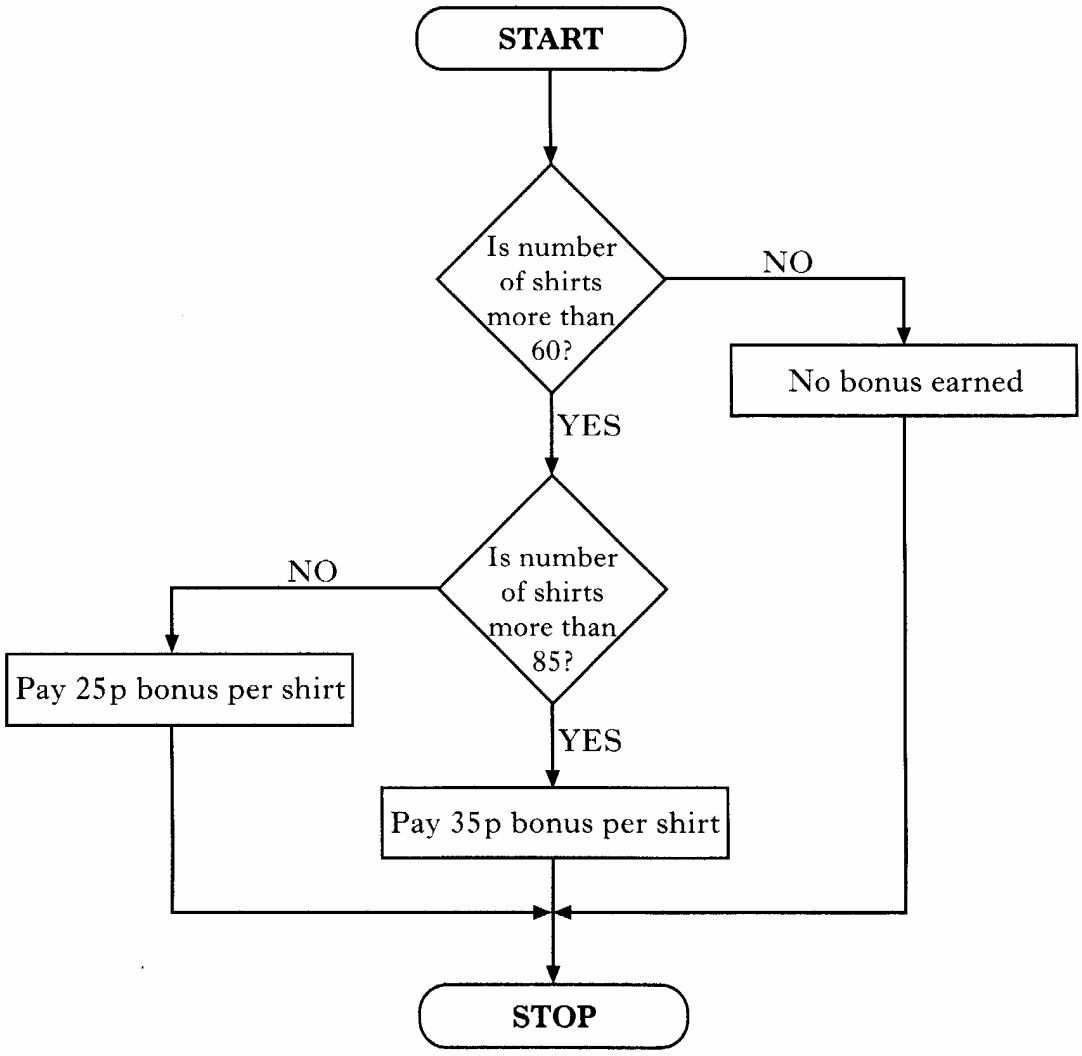
[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

5. Janis works in a shirt factory.

This flowchart is used to work out the weekly bonus she is paid for making shirts.



(*a*) Janis made 102 shirts one week. Calculate her bonus.

2

(*b*) Is it possible for Janis to earn a bonus of **exactly** £25 for making shirts?

Explain your answer.

3

Marks

6. Ali drove overnight 406 miles from Galashiels to Portsmouth to catch a ferry to France.

His average speed for the journey was 56 miles per hour.

He arrived in Portsmouth at 0630.

At what time did he leave Galashiels?

4

7. A group of students was asked how many times they had visited a cinema during the last month.

The results are shown in this frequency table.

Number of visits	*Frequency*	*Visits × Frequency*
0	104	
1	56	
2	44	
3	20	
4	10	
5	1	
	Total = 235	Total =

Complete the table above and find the mean number of visits.

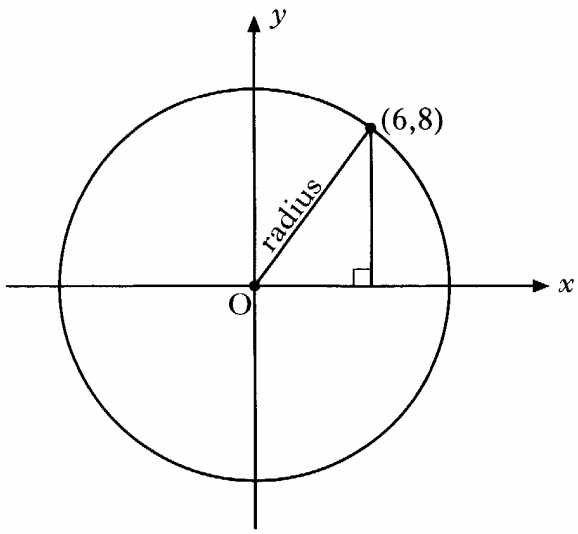
Give your answer correct to 1 decimal place.

3

DO NOT WRITE IN THIS MARGIN

Marks

8. The circle shown below has centre (0,0).
The point (6,8) lies on the circle.



Work out the area of this circle.

4

DO NOT WRITE IN THIS MARGIN

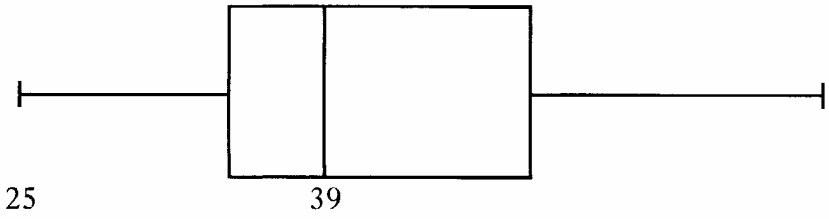
Marks

9. Ian measures the heights of some plants which have been growing for one month.

Their heights (in millimetres) are shown below.

29 25 37 35 35 37 41 46 39 47 56 61 49

Complete the boxplot, drawn below, to show the heights of the plants.



4

10. An art dealer paid £120 for an oil painting.

He sold it for £150.

Express the profit as a percentage of what he paid for the painting.

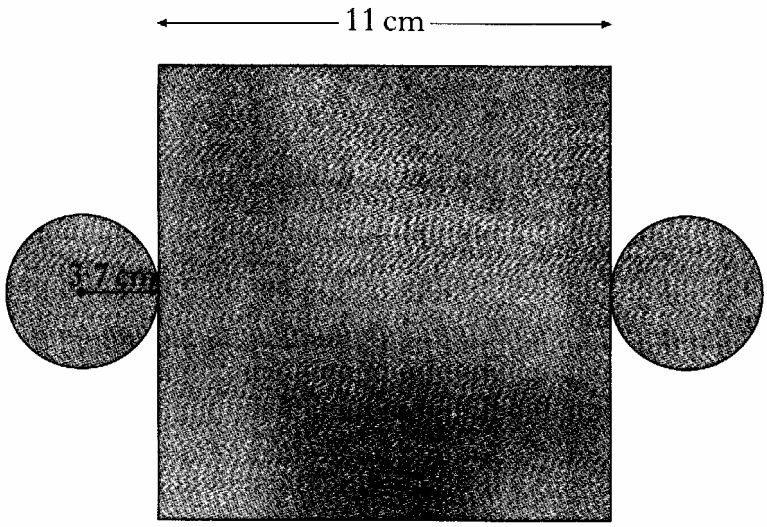
4

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

11. The diagram below shows the net of a cylinder.



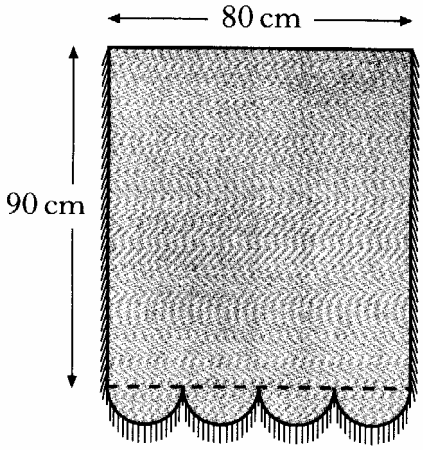
Calculate the **curved** surface area of the cylinder.

3

Marks

12. This window blind is in the shape of a rectangle with four equal semi-circles at the bottom.

It has braid down the two sides and round the bottom.



Calculate the total length of braid needed for this blind.
Give your answer to the nearest centimetre.

5

[*END OF QUESTION PAPER*]