Total mark

X100/101

FRIDAY, 20 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.**

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.

3   Full credit will be given only where the solution contains appropriate working.

4   Before leaving the examination room you must give this book to the invigilator. If you do not you may lose all the marks for this paper.
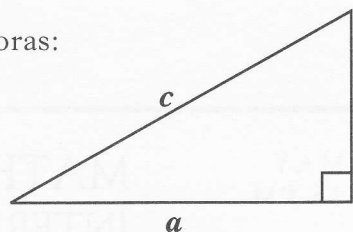
FORMULAE LIST
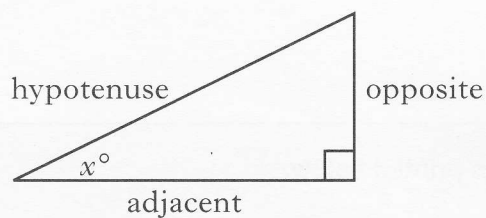
Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:

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

Trigonometric ratios
in a right angled
triangle:

$$\tan x° = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin x° = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos x° = \frac{\text{adjacent}}{\text{hypotenuse}}$$

ALL questions should be attempted.

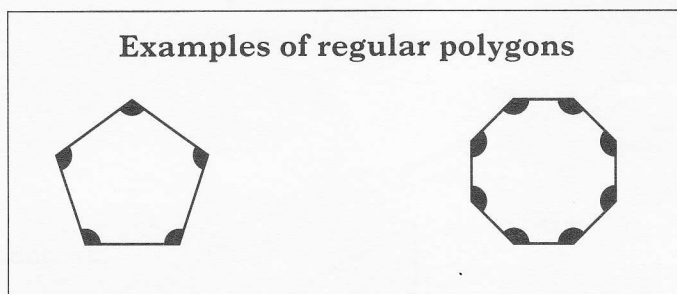1. (*a*) Find $6.17 - 2.3$.

    (*b*) Find 75% of £1200.

2. Joyce is going on holiday. She must be at the airport by 1.20 pm. It takes her 4 hours 30 minutes to travel from home to the airport. What is the latest time that she should leave home for the airport?
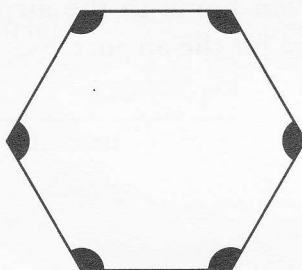
1

1

1

[Turn over

3. A regular polygon is a shape with three or more equal sides.

> **Examples of regular polygons**

A rule used to calculate the size, in degrees, of each angle in a regular polygon is:

> Size of each angle = 180 − (360 ÷ number of sides)

Calculate the size of each angle in the regular polygon below.
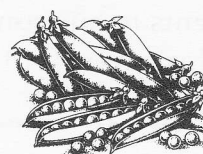
Do not measure with a protractor.

You must show your working.

2

4. The number of peas counted in each of 100 pea pods is shown in this frequency table.

Peas in pod	Frequency	Peas in pod × Frequency
3	5	15
4	10	40
5	28	140
6	36	216
7	12	
8	9	
	Total = 100	Total =

Complete the table above **and** calculate the mean number of peas in a pod.

3

5. Solve algebraically the equation

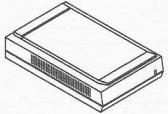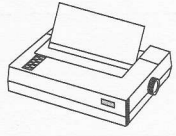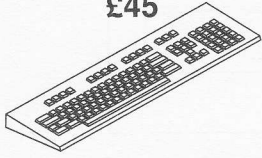$$11a - 8 = 37 + 6a.$$

3

[Turn over

6. Anwar wants to buy some accessories for his computer.
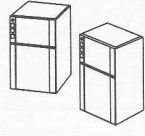He sees this advert for Cathy's Computers.

Cathy's Computers

Digital Camera **£95**

Scanner **£75**

Printer **£70**

Cordless Keyboard **£45**

Pair of Speakers **£40**

Special Offer

Free microphone when you spend £160 or more

Anwar wants to spend enough to get the free microphone.

He can afford to spend a maximum of £200.

He does not want to buy more than one of each accessory.

One combination of accessories that Anwar can buy is shown in the table below.

Digital Camera £95	Scanner £75	Printer £70	Cordless Keyboard £45	Pair of Speakers £40	Total Value
	✓	✓		✓	£185

Complete the table to show **all** possible combinations that Anwar can buy.

3

7. (*a*) Complete the table below for $y = -2x + 5$.

x	-2	0	4
y			

(*b*) Draw the line $y = -2x + 5$ on the grid.
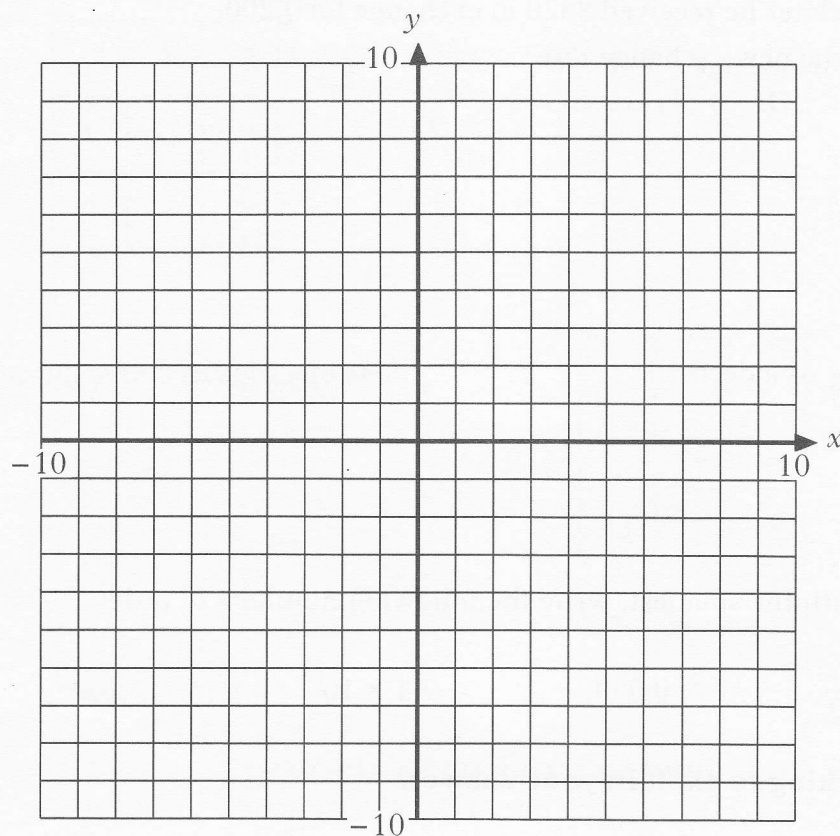
[Turn over

8. (*a*) While in New York, Martin changed £50 into US dollars.

The exchange rate was £1 = $1·62.

How many US dollars did Martin receive for £50?

(*b*) A few days later he received $320 in exchange for £200.

What was the new exchange rate?

9. (*a*) Write $\dfrac{7}{1000}$ as a decimal.

(*b*) Starting with the smallest, write the following numbers in order.

$$\frac{7}{1000}, \qquad 0\cdot069, \qquad 7\cdot1 \times 10^{-4}$$

Show working to explain your answer.

10. In a **magic square**, the numbers in each row, each column and each diagonal add up to the same **magic total**.

In this magic square the **magic total** is 3.

-2	5	0
3	1	-1
2	-3	4

(a)

-4	3	-2
1	-1	-3
0	-5	2

This is another magic square.
What is its **magic total**?

1

(b) Complete this **magic square**.

1		
	-2	
-3		-5

3

[END OF QUESTION PAPER]

Total
mark

X100/103

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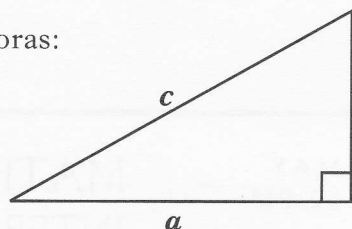
FORMULAE LIST

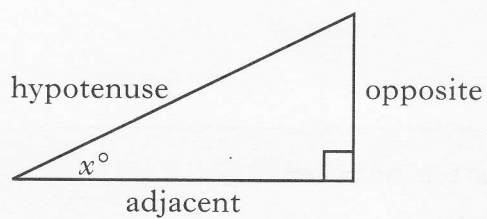Circumference of a circle: $\qquad C = \pi d$

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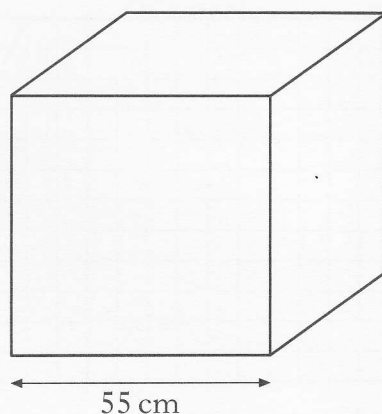$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

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ALL questions should be attempted.

1. Calculate the volume of the cube below.

55 cm

Round your answer to the nearest thousand cubic centimetres.

2

2. Claire sells cars.

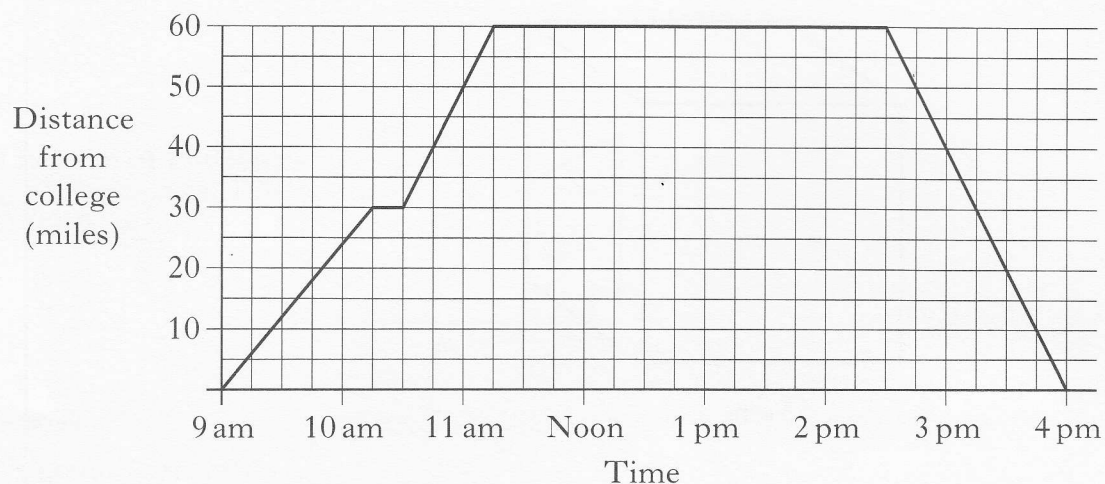She is paid £250 per month plus 3% commission on her sales.

How much is she paid in a month when her sales are worth £72 000?

2

[Turn over

Marks

3. A group of students visit a theme park.

The graph below shows their journey.

They set off from the college at 9 am and arrive back at 4 pm.

Distance from college (miles)

Time

(*a*) How long did the students spend at the theme park?

1

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

3

4. Solve algebraically the inequality

$$3t + 4 > 28.$$

2

Marks

5. The stem and leaf diagram below shows the ages of the players in the Kestrels rugby team.

AGES
Kestrels

```
1 | 9
2 | 1 3 4 7 9
3 | 0 2 4 5 5 5 8 9
4 | 1
```
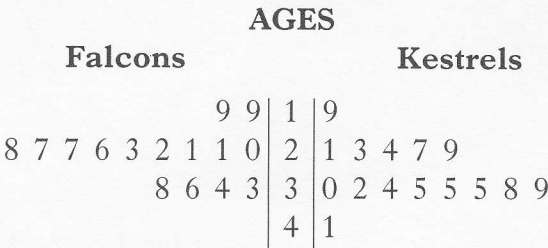
2 | 1 represents 21 years

(*a*) What age is the oldest player?

1

(*b*) Calculate the range of ages.

2

The stem and leaf diagram below shows the ages of both the Kestrels and the Falcons rugby teams.

AGES

Falcons   **Kestrels**

```
              9 9 | 1 | 9
8 7 7 6 3 2 1 1 0 | 2 | 1 3 4 7 9
        8 6 4 3 | 3 | 0 2 4 5 5 5 8 9
                  | 4 | 1
```

2 | 1 represents 21 years

(*c*) Compare the ages of the two teams. Comment on any difference.

1

[Turn over

Marks

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

$$11n + 4(7 - 2n).$$

2

(*b*) Factorise $15 + 6x.$

2

7. The scores of 12 golfers in a competition were as follows.

$$\begin{array}{cccccc} 67 & 70 & 68 & 75 & 71 & 70 \\ 70 & 75 & 76 & 75 & 74 & 75 \end{array}$$

(*a*) Find the modal score.

1

(*b*) Find the median score.

2

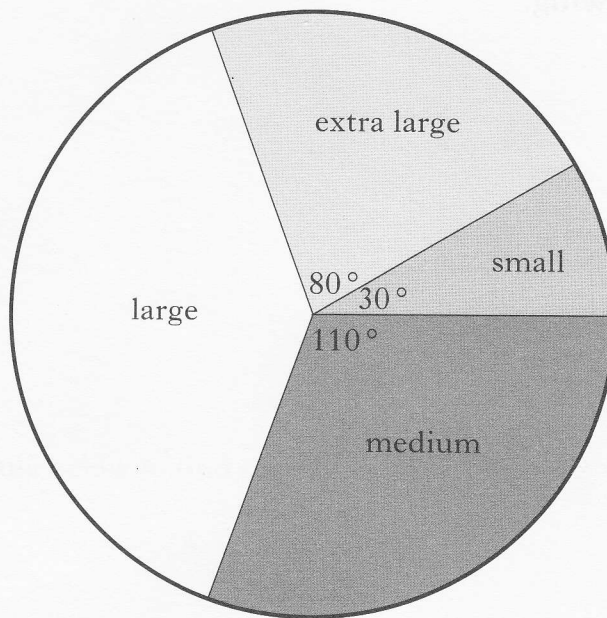(*c*) Find the probability of choosing a golfer from this group with a score of 70.

1

8. 60 workers in a factory voted on a new pay deal.

42 of them voted to accept the deal.

What percentage voted to accept the deal?

9. The pie chart shows the different sizes of eggs laid by a flock of hens.
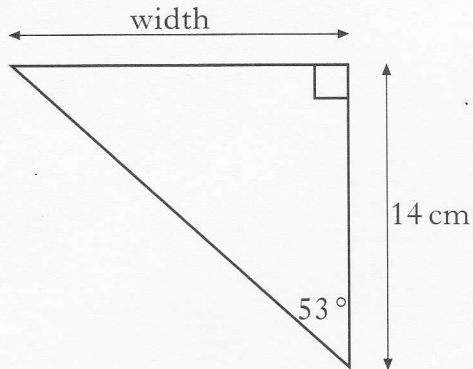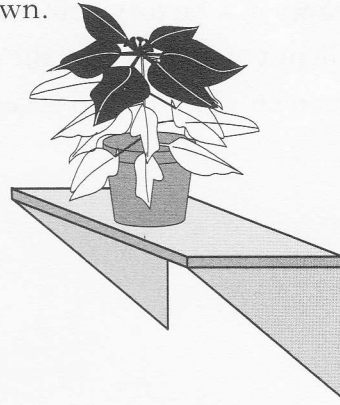

The flock of hens laid 1260 eggs.

How many of the eggs were large?

Page seven

[Turn over

10. A rectangular shelf is supported by brackets as shown.
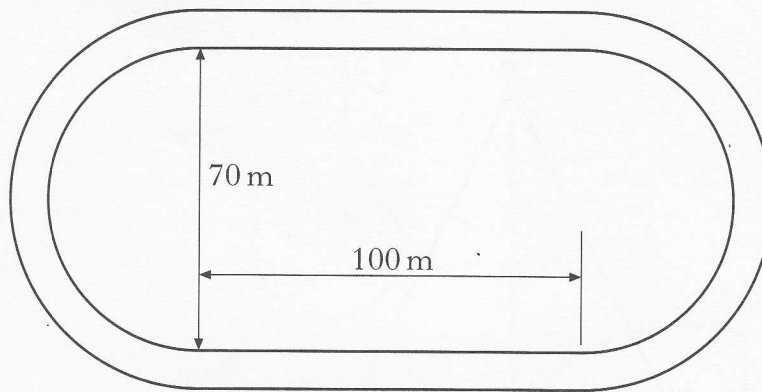
Each bracket is a right angled triangle.

Calculate the width of this bracket.

Give your answer correct to one decimal place.

Do not use a scale drawing.

4

11. The diagram below shows a speedway track.

The straights are each 100 metres long.

The bends are semi-circles as shown.

Calculate the perimeter of the inside of the track.

4

12. Use the formula below to find the value of A when $b = 2 \cdot 4$ and $c = 5$.
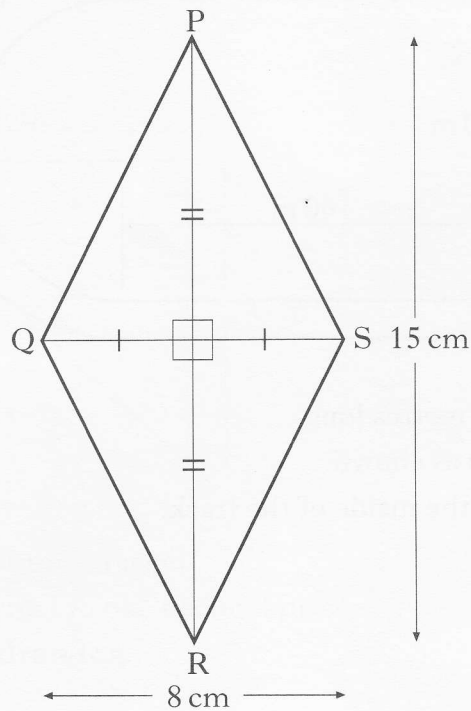
$$A = 3bc^2$$

3

[Turn over

13. PQRS is a rhombus.

The diagonals PR and QS are 15 centimetres and 8 centimetres long as shown.

Calculate the length of side PQ.

Do not use a scale drawing.

3

14. Margaret is recovering from an operation.

She needs to take 4 tablets each day for a year.
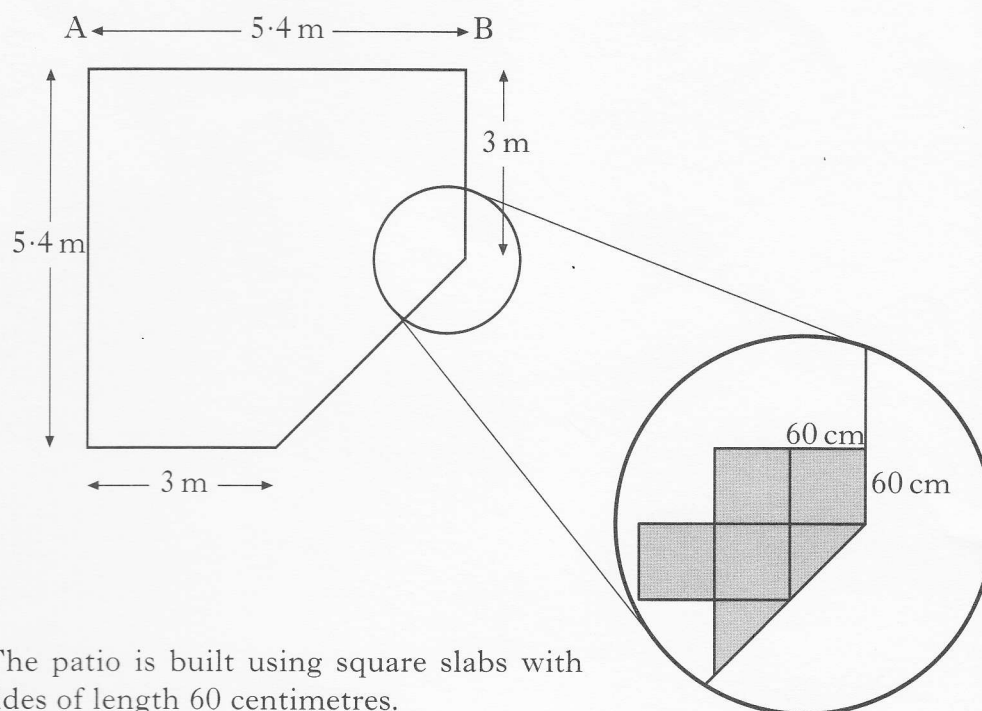
The tablets are supplied in boxes of 200.

Each box costs £6·50.

How much does it cost for the year's supply?

3

15. The diagram below shows a plan of a patio.

The patio is built using square slabs with sides of length 60 centimetres.

The slabs can be cut in half to fit as shown.

(a) How many slabs fit exactly along edge AB?

(b) How many slabs are needed altogether to build the patio?

[END OF QUESTION PAPER]