NATIONAL QUALIFICATIONS 2012

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

MONDAY, 21 MAY   9.00 AM – 9.35 AM

X1001001

X100/10/01

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day   Month   Year   Scottish candidate number

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.

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

SQA

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:

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

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

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

All questions should be attempted.

1. (*a*) Find $8 \cdot 31 - 5 \cdot 6$.

1

(*b*) Find $0 \cdot 029 \times 400$.

1

(*c*) Find $\frac{2}{7}$ of 434.

1

2. A college class consists of 8 male and 12 female students.

A student is chosen at random from the class.

What is the probability that the student is male?

Give your answer as a fraction in its simplest form.

2

[Turn over

3. The weight of a grain of salt is about 0·0000586 grams.

Write this weight in standard form.

2

4. Linda sells make-up. Her basic pay is £50 per week.

She is also paid 30% commission on all sales **over £200**.

How much is she paid altogether in a week when she sells £620 worth of make-up?

3

X100100104

5. (*a*) Complete the table below for $y = 0 \cdot 5x + 3$.

x	−8	0	4
y			

2

(*b*) Draw the line $y = 0 \cdot 5x + 3$ on the grid.

2
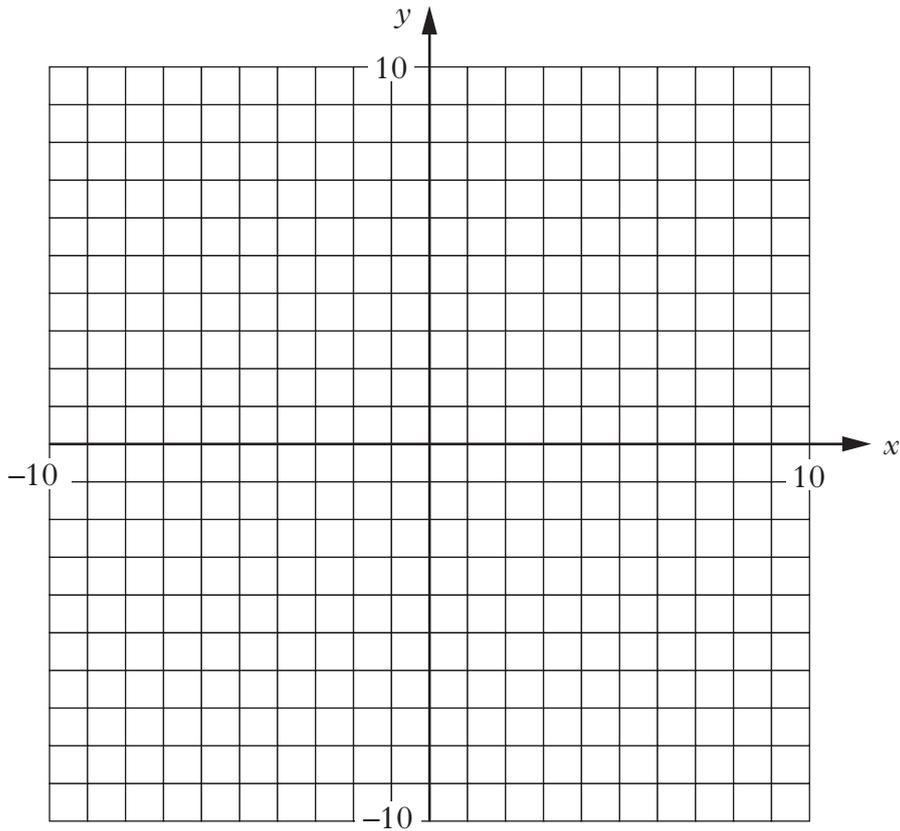
[Turn over

6. Two hundred teenagers were asked how many songs they had downloaded during the previous week.

The frequency table below shows their responses.

Number of Songs	Frequency
5	38
6	72
7	53
8	30
9	7
	Total = 200

(*a*) Write down the modal number of songs downloaded.

1

(*b*) Find the range of the number of songs downloaded.

1

X100100106

6. (continued)

(*c*) Complete the table below **and** find the mean number of songs downloaded.

Number of Songs	Frequency	Number of Songs × Frequency
5	38	190
6	72	432
7	53	371
8	30	
9	7	
	Total = 200	Total =

3

[Turn over

7. (*a*) The formula for the volume of this shape is

Volume = area of end × length
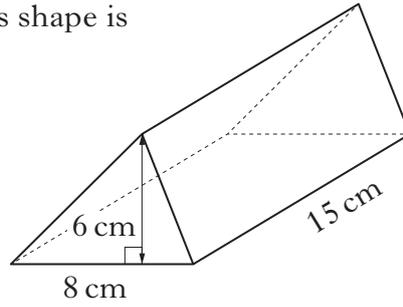
The end of this shape is a triangle.

Use the formula to work out the volume of this shape.

3

(*b*) This cuboid has the same volume as the shape shown above.

Find the height of the cuboid.

2
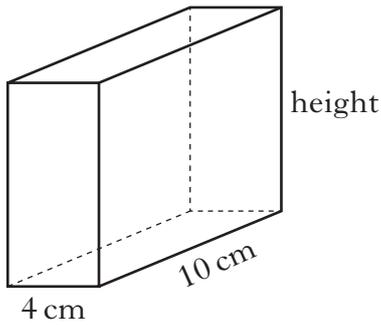
8. Find the missing number in each machine.

(*a*)

IN

OUT

-3 — multiply by (-2) — subtract 17 — ?

(*b*)

IN

OUT

? — multiply by (-2) — subtract 17 — -35
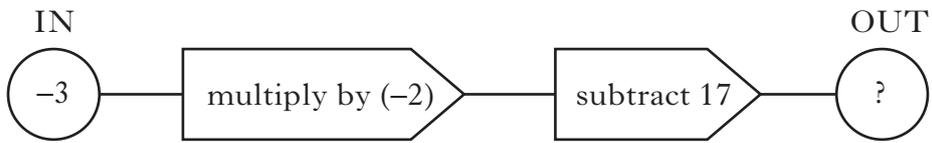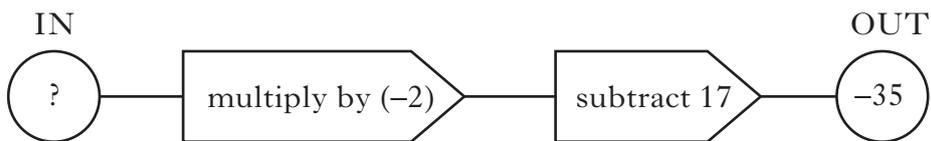
[Turn over for Question 9 on *Page ten*

9. Solve algebraically the inequality

$$\frac{1}{4}n - 2 < 10.$$

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL SPACE FOR ANSWERS

NATIONAL QUALIFICATIONS 2012

MATHEMATICS
INTERMEDIATE 1
Units 1, 2 and 3
Paper 2

MONDAY, 21 MAY   9.55 AM – 10.50 AM

X1001002

X100/10/02

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth
Day   Month   Year   Scottish candidate number

1 **You may 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.

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

SQA

X100100201

FORMULAE LIST

Circumference of a circle: $C = \pi d$
Area of a circle: $A = \pi r^2$
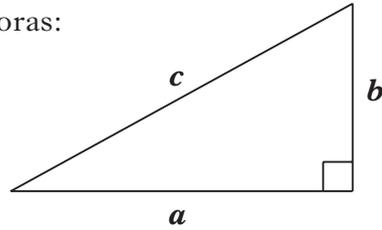
Theorem of Pythagoras:

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

Trigonometric ratios
in a right angled
triangle:
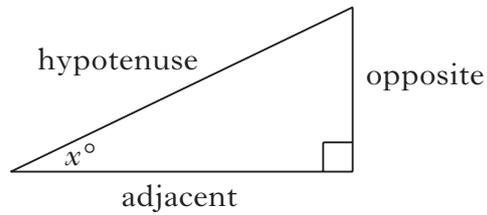
$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

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

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

1. It will take Hassan 3 hours 40 minutes to drive from Dundee to Stranraer.

He must be in Stranraer by 2.15 pm.

What is the latest time he should leave Dundee?

1

[Turn over

X10010 0203

2. A recipe lists the ingredients needed to make 4 portions of chilli con carne.

Ingredients for 4 portions of chilli con carne	
Minced beef	700 grams
Onions	2
Chilli powder	1 teaspoon
Kidney beans	300 grams
Chopped tomatoes	300 grams

How many grams of minced beef would be needed to make 9 portions of chilli con carne?

2

X100100204

3. Multiply out the brackets and simplify

$$4(2 - 3x) + 5(4x + 1).$$

3

4. Factorise

$$15a + 12.$$

2

[Turn over

5. Carla likes to keep fit.

She plans a workout by choosing activities from an exercise DVD.

She can choose from the following activities.

Activity	Activity time
Aerobics	30 minutes
Yoga	25 minutes
Jogging	20 minutes
Toning	15 minutes
Tums and Hips	12 minutes

Carla wants to choose **three** different activities.

She wants to exercise for a **minimum** of 60 minutes.

One combination of **three** different activities that Carla can choose is shown in the table below.

Aerobics 30 minutes	Yoga 25 minutes	Jogging 20 minutes	Toning 15 minutes	Tums and Hips 12 minutes	Total Time minutes
✓	✓	✓			75

Complete the table to show **all** the possible combinations of **three** different activities that Carla can choose.

3

6. The stem and leaf diagram below shows the heights of the girls in a Primary 7 class.

HEIGHTS

Girls

$$
\begin{array}{r|lllll}
11 & 1 & 6 \\
12 & 2 & 5 & 9 \\
13 & 0 & 1 & 6 & 8 & 8 \\
14 & 3 & 4 & 7 \\
\end{array}
$$

12 | 5   represents 125 centimetres

(a) What height is the tallest girl?

1

(b) Find the median height.

1

The stem and leaf diagram below shows the heights of both the boys and the girls in this class.

HEIGHTS

Boys   **Girls**

$$
\begin{array}{rrrrr|l|lllll}
 & 9 & 8 & 5 & 1 & 11 & 1 & 6 \\
8 & 7 & 4 & 3 & 3 & 12 & 2 & 5 & 9 \\
 & & 6 & 2 & 1 & 13 & 0 & 1 & 6 & 8 & 8 \\
 & & & & 7 & 14 & 3 & 4 & 7 \\
\end{array}
$$

12 | 5   represents 125 centimetres

(c) Compare the heights of the boys with the girls in this class.

Comment on the overall difference.

1

X100100207

7. Solve algebraically the equation

$$5y + 19 = 61 - 2y.$$

X100100208

8. A ladder which is 5·2 metres long is placed against a wall.

The foot of the ladder is 1·6 metres from the wall.

The size of the angle between the ladder and the ground is $x°$.

Calculate x.

Do not use a scale drawing.

5·2 m

$x°$

1·6 m

3

[Turn over

X100100209
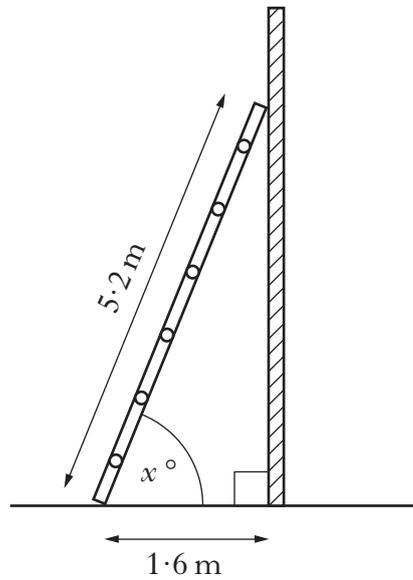
9. Whistler downhill ski course is 3·1 kilometres long.

Finlay completed the course in 2 minutes 5 seconds.

Find his average speed in **metres per second**.

10. The table below shows the number of visitors to Ballyvarick Castle from April to September.

Month	April	May	June	July	August	September
Visitors (to nearest hundred)	2000	3000	4400	7800	8600	5400

On the grid below, draw a **line** graph to show this information.

Month
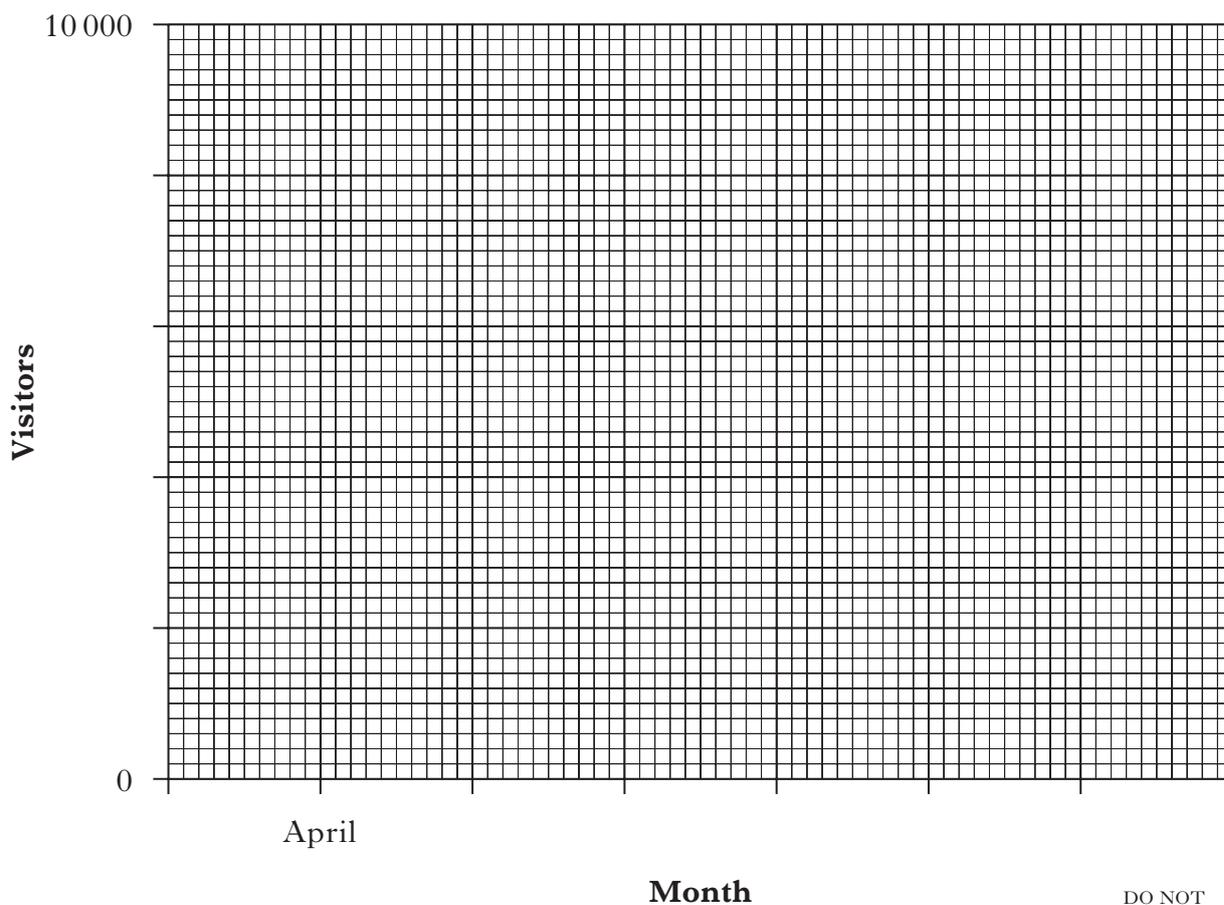
11. Margaret insures her house which is worth £105 000.

The annual premium is £3·20 for every £1000 worth of cover.

She is given a discount of $\frac{1}{8}$ of her annual premium.

How much does Margaret pay to insure her house?

HOUSE INSURANCE
Special Offer
$\frac{1}{8}$ **OFF**

3

12. A room in the Caledonian Hotel in New York costs 280 dollars per night plus 17% tax.

The exchange rate is 1·51 dollars to the pound.

Find the cost of the room per night.

Give your answer in pounds and pence.

4
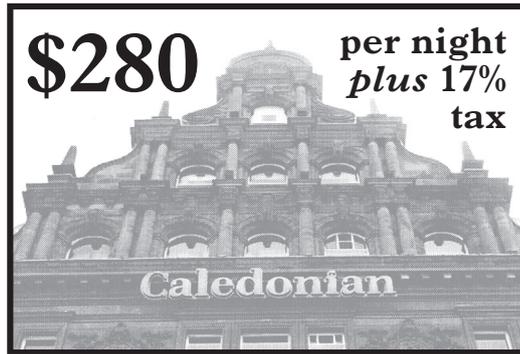
[Turn over

13. Use the formula below to find the value of S when $n = 6$.

$$S = \frac{n^2 + 3n}{4}$$

3

14. The diagram shows the end view of a building.
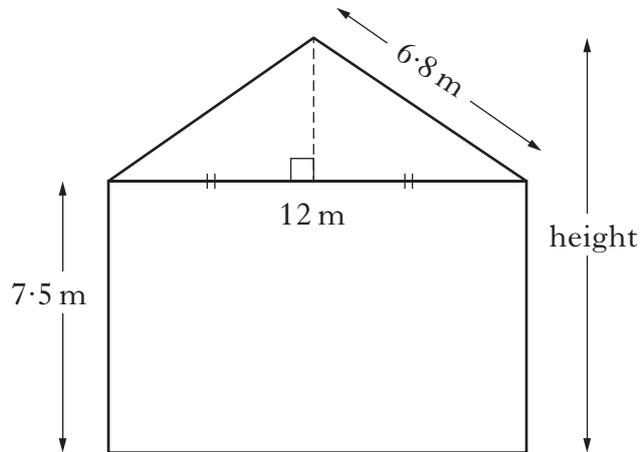
Calculate the total height of the building.
Do not use a scale drawing.

4

[Turn over

15. A market trader buys a box of twelve shirts for £80.

He sells them for £9 each.

(*a*) How much profit does he make altogether?

1

(*b*) Express his profit as a percentage of what he paid for the shirts.

3

X100100216

16. A section of lawn edging consists of a rectangle with five equal semi-circles at the top.

14 cm

60 cm
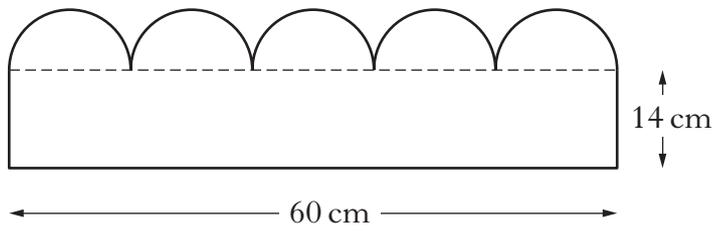
Calculate the area of the section in square centimetres.

Give your answer correct to the **nearest square centimetre**.

5

[*END OF QUESTION PAPER*]

X100100217

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL SPACE FOR ANSWERS

[BLANK PAGE]

DO NOT WRITE ON THIS PAGE