X100/101

Total mark

SQA

NATIONAL
QUALIFICATIONS
2008

TUESDAY, 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.

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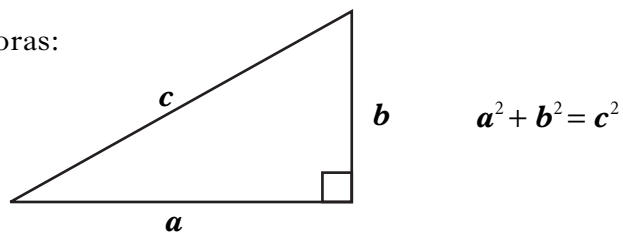Use blue or black ink. Pencil may be used for graphs and diagrams only.
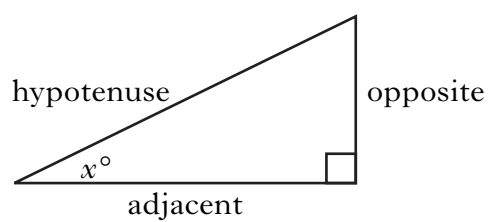
SQA ©

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:

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

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

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

ALL questions should be attempted.

1. (*a*) Find $2 \cdot 685 - 0 \cdot 29$.

   1

   (*b*) Find 14×3000.

   1

   (*c*) Find $5 \cdot 45 \div 5$.

   1

2. Sandra works night shift. One night she started work at 2235 and finished at 0715 the next morning.
   How long did Sandra's shift last?

   1

   [Turn over

3. The diameter of a red blood cell is 6.5×10^{-3} millimetres.
Write this number in full.

2

4. A plumber charges £20 for being called out to a job, plus £12 **for each 15 minutes** he takes to do the job.
How much does he charge for a job which takes 2 hours?

2

5. A building company employs 70 staff.

The number of staff absences during the last year is shown in the frequency table below.

Number of Absences (Days)	Frequency
0	7
1	21
2	18
3	11
4	8
5	5
Total	70

(*a*) Find the probability of choosing a member of staff who had no absences.

1

(*b*) Complete the table below **and** calculate the mean number of absences.

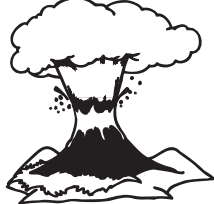| Number of Absences (Days)	Frequency	Number of Absences × Frequency
0	7	0
1	21	21
2	18	36
3	11	
4	8	
5	5	
Total	70	

3

6. Frances is on holiday. She wants to book some of the excursions shown in the advert below.

EXCURSIONS

Pirate Cruise
£40

Dinner and Cabaret
£55

Volcano Trip
£35

Parrots and Dolphins
£25

Caves and Grottos
£30

Reps' Show
£20

(or **free** when you
spend £110 or more
on **three** excursions)

- Frances wants to book **four** different excursions.
- She can afford to spend a **maximum of £120**.
- She gets a **free** ticket for the Reps' Show when she spends £110 or more on **three** excursions.

6. (continued)

Two combinations of **four** excursions that Frances can afford are shown in the table below.

Dinner and Cabaret £55	55							
Pirate Cruise £40		40						
Volcano Trip £35		35						
Caves and Grottos £30	30							
Parrots and Dolphins £25	25	25						
Reps' Show £20 or Free	Free	20						
Total Price	£110	£120						

Complete the table to show **all** possible combinations that Frances can afford.

3

7. Solve algebraically the equation

$$7m - 8 = 40 + m.$$

3

[Turn over

8. (*a*) Complete the table below for $y = 2 \cdot 5x - 3$.

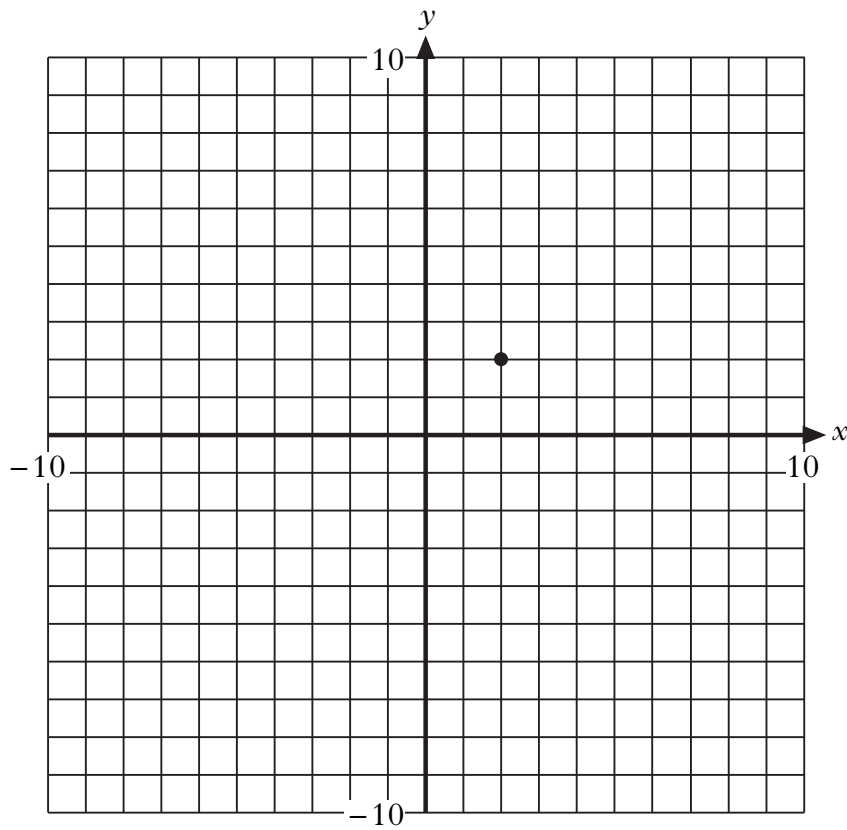| x	-2	0	2	4
y			2	

(*b*) Draw these **two** lines on the grid:

(i) $y = 2 \cdot 5x - 3$;

(ii) $y = 3$.

Marks

9. Evaluate $x^2 - y$ when $x = -8$ and $y = 73$.

3

10. Jamie invests £1440 in a savings account.
The rate of interest is 5% per annum.
Calculate the interest he should receive after 3 months.

4

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

[BLANK PAGE]

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X100/103

SQA

NATIONAL QUALIFICATIONS 2008

TUESDAY, 20 MAY
1.55 PM – 2.50 PM

MATHEMATICS
INTERMEDIATE 1
Units 1, 2 and 3
Paper 2

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Day	Month	Year	Scottish candidate number

Number of seat

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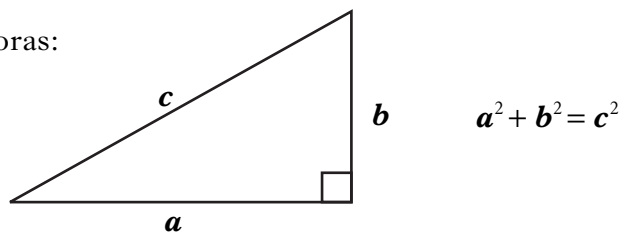Use blue or black ink. Pencil may be used for graphs and diagrams only.

FORMULAE LIST

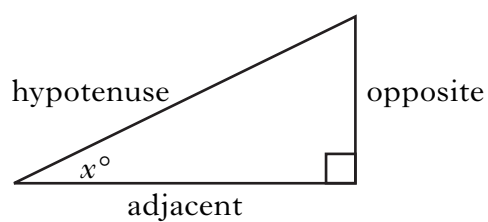Circumference of a circle: $C = \pi d$
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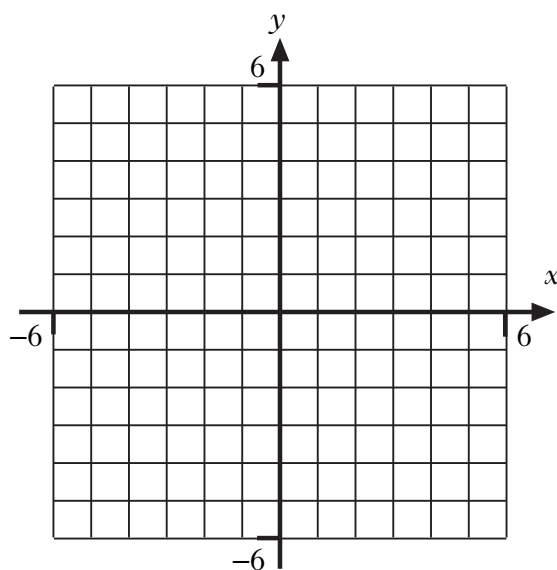triangle:

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

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

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

ALL questions should be attempted.

Marks

1. (*a*) On the grid below plot the points A(–2,4), B(–4,–1) and C(1,–3).

2

(*b*) Plot the point D so that shape ABCD is a square.

1

[Turn over

Marks

2. The table below shows the basic annual premiums charged for car insurance by an insurance company.

The basic premium depends on the area where the driver lives and the group their car belongs to.

AREA	BASIC ANNUAL PREMIUM				
	CAR GROUP				
	1	2	3	4	5
A	£428	£517	£613	£725	£838
B	£497	£555	£659	£779	£898
C	£525	£598	£712	£841	£975
D	£540	£651	£775	£915	£1055

(*a*) Lynn's car is in group 4 and she lives in area C.

Write down her basic annual premium.

1

Drivers who do not make a claim on their insurance receive a discount on their basic annual premium as shown in the table below.

Number of years without a claim	1	2	3	4 or more
Discount	30%	40%	55%	67%

(*b*) Lynn has not made a claim for 4 years.

How much will it cost her to insure her car?

2

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

$$4(5u - 2) + 15.$$

2

(*b*) Factorise $\qquad 9c + 24.$

2

[Turn over

4. A grass lawn is treated with weedkiller.

The lawn is split into twenty squares each of the same area.

Ten of the squares are treated with Weedclear.

Three weeks later the number of weeds in each of these squares is as follows:

$$3, \quad 4, \quad 6, \quad 2, \quad 1, \quad 7, \quad 2, \quad 1, \quad 1, \quad 3.$$

(*a*) Find the median.

2

(*b*) Find the range.

1

The other ten squares are treated with Noweed.

For these squares the median is 2 and the range is 10.

(*c*) Make **two** comments comparing the number of weeds in squares treated with Weedclear and Noweed.

2

Marks

**5.** Ross drove 190 miles from Preston to Edinburgh in 3 hours 30 minutes.

During the first part of his journey he drove for 2 hours at an average speed of 68 miles per hour.

Find the average speed in miles per hour for the rest of his journey.

4

[Turn over

6. Some biology students were doing a project on "creepy crawlies". The pie chart shows the different types of creepy crawlies that the students collected from a garden.
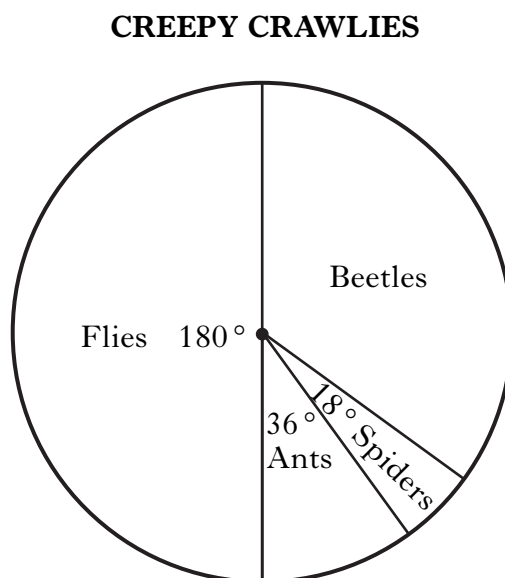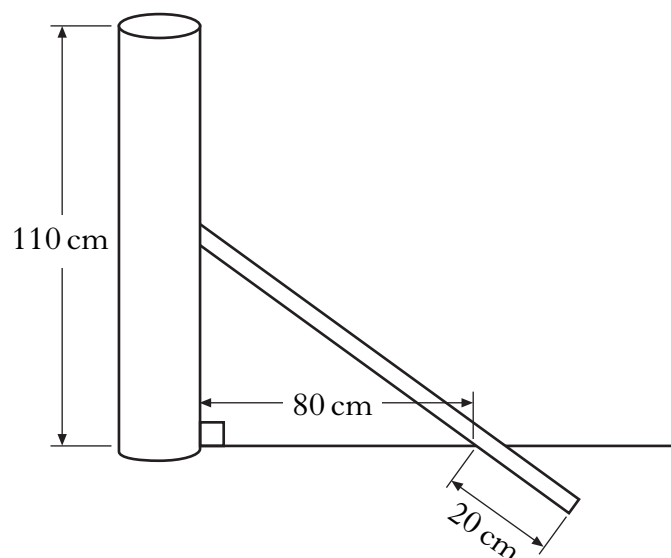
CREEPY CRAWLIES

The students collected 220 creepy crawlies altogether.

How many of them were beetles?

3

Marks

7. A farmer is building a wire fence around a field.

The fence has heavy posts at the corners.

Each corner post is supported by a stake as shown in the diagram.

- The corner post is 110 centimetres high.
- The stake meets the corner post halfway up.
- The stake meets the ground 80 centimetres from the foot of the corner post.
- 20 centimetres of the stake is below ground level.

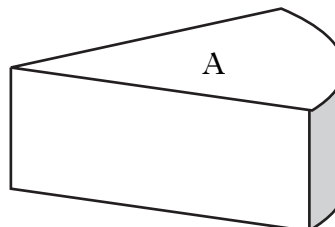Calculate the length of the stake.
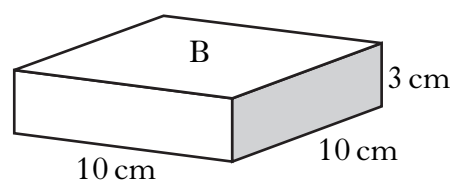
Do not use a scale drawing.

4

[Turn over

8. Shown below are two pieces of cheese.

The weight of each piece is proportional to its volume.

Piece A has a volume of 400 cubic centimetres.
It weighs 480 grams.

A

Piece B is a cuboid.

B

3 cm

10 cm

10 cm

Find the weight of piece B.

4

9. The table shows the ticket prices for a theme park in France.

The prices are given in euros.

Ticket	Adult price	Child price
Bronze (valid 1 day)	€50	€40
Silver (valid 2 days)	€90	€75
Gold (valid 3 days)	€110	€85

Gavin buys silver tickets for two adults and one child.

Find the total cost, in pounds and pence, of buying these tickets if the exchange rate is £1 = 1·39 euros.
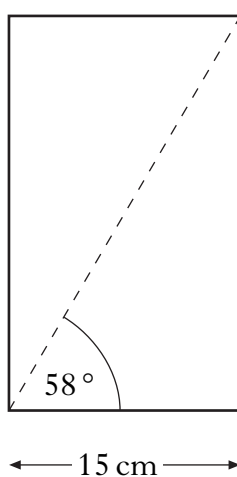
3

[Turn over

10. Solve algebraically the inequality

$$\tfrac{1}{2}y + 3 > 13.$$

2

11. Calculate the area of the rectangle shown below.
Do not use a scale drawing.

58°

←— 15 cm —→

4

12. Use the formula below to find the value of T when $r = 2 \cdot 6$ and $s = 1 \cdot 4$.
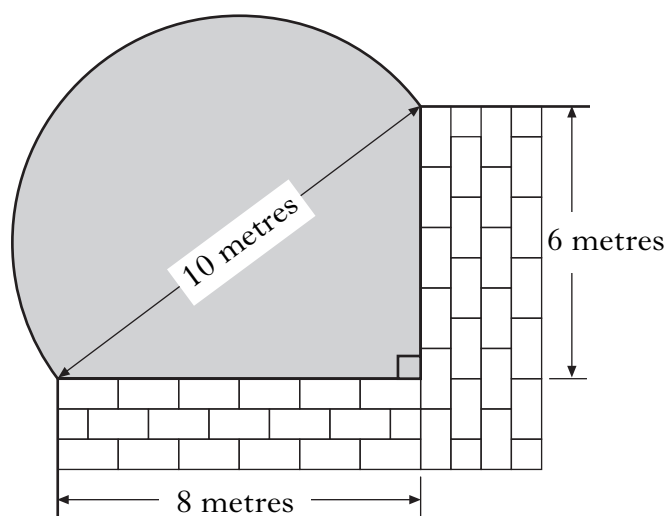
$$T = \frac{rs}{r+s}$$

3

[Turn over

Marks

13. Sergei has been training to run a marathon.

Since he started training his weight has dropped from 80 kilograms to 74 kilograms.

Express his weight loss as a percentage of his original weight.

4

Marks

14. The diagram below shows part of a garden which is being watered from a sprinkler.

The area being watered is in the shape of a semi-circle and a right angled triangle.

Calculate the area being watered.

4

[*END OF QUESTION PAPER*]