

FOR OFFICIAL USE

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Total Mark

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NATIONAL QUALIFICATIONS 2013

MATHEMATICS
INTERMEDIATE 1
 Units 1, 2 and 3
 Paper 2



X100/10/02

WEDNESDAY, 22 MAY 9.55 AM – 10.50 AM

Fill in these boxes and read what is printed below.

Full name of centre

Town

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Forename(s)

Surname

Number of seat

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Date of birth

Day

Month

Year

Scottish candidate number

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- You may use a calculator.**
- 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.
- Full credit will be given only where the solution contains appropriate working.
- 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.



FORMULAE LIST

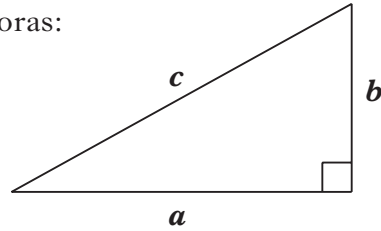
Circumference of a circle:

$$C = \pi d$$

Area of a circle:

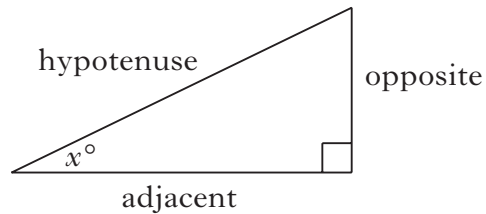
$$A = \pi r^2$$

Theorem of Pythagoras:



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

Trigonometric ratios
in a right angled
triangle:



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

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

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



Marks

1. On the “PayforGold” website, the price paid for gold is proportional to its weight.

Colleen sells a matching gold bracelet and necklace on this website.

She is paid £95 for the 20 gram bracelet.

How much is she paid for the 24 gram necklace?

2

2. (a) Multiply out the brackets and simplify

$$6(2n - 3) + 11.$$

2

- (b) Factorise

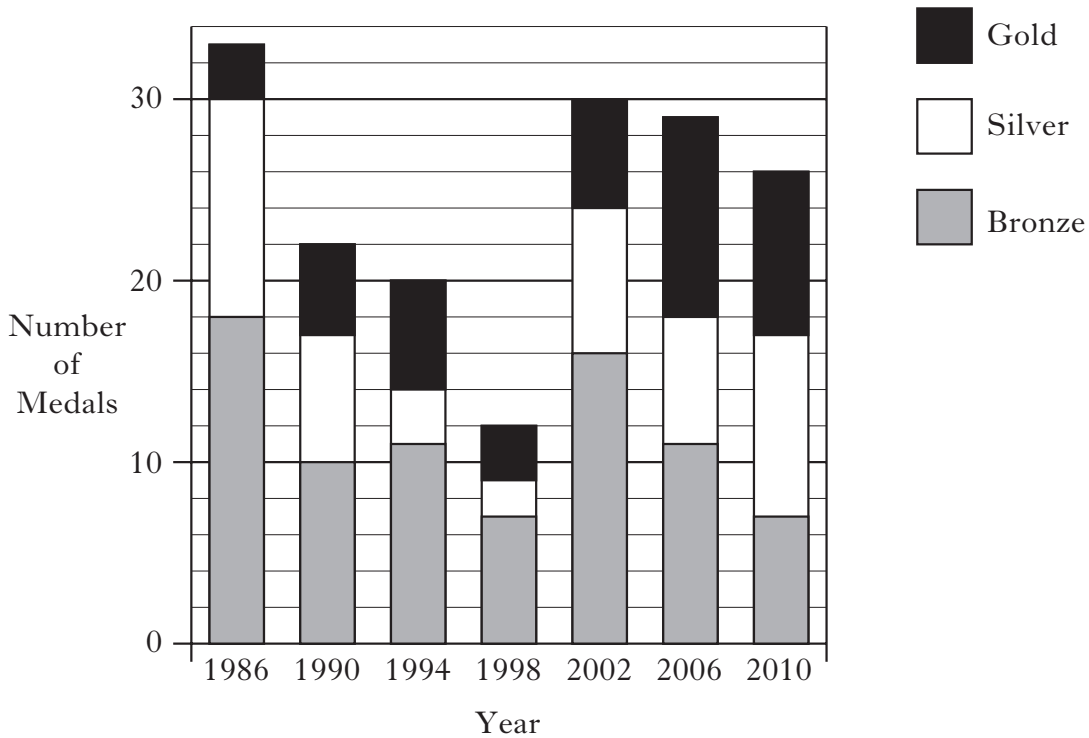
$$20s + 45.$$

2



Marks

3. The bar graph shows the number of medals won by Scotland at the Commonwealth Games since 1986.



(a) In which year were most **gold** medals won by Scotland?

1

(b) How many **silver** medals did Scotland win in 1990?

1



Marks

4. Solve algebraically the equation

$$8d + 7 = 5d + 58.$$

3

5. Chris took part in a track cycling competition.
He completed 6 laps of a 500 metre track.
This took him 4 minutes.
Find his average speed in **metres per second**.

3

[Turn over



Marks

6. (a) The population of China is 1.352×10^9 .
Write this number in full.

1

- (b) The population of Scotland is 5.2 million.
How many times bigger is the population of China than that of
Scotland?

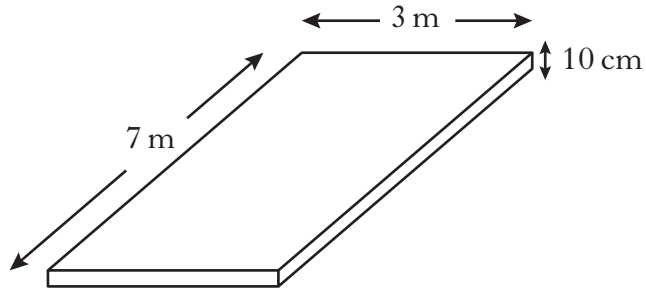
2



Marks

7. Bob is building a patio with a concrete base.

The base of the patio is 7 metres long, 3 metres wide and 10 centimetres deep.



Concrete costs £60 **per cubic metre**.

Find the total cost of the concrete for the base of Bob's patio.

3

[Turn over



Marks

8. John and Steven are playing snooker. They play eight games.
Shown below are the number of points John scored in each game.

21 39 22 53 45 19 43 46

(a) Find the median.

(b) Find the range.

(c) The median number of points Steven scored is 23 and the range is 15.

Make **two** comments comparing the number of points scored by Steven and John.

2

1

2

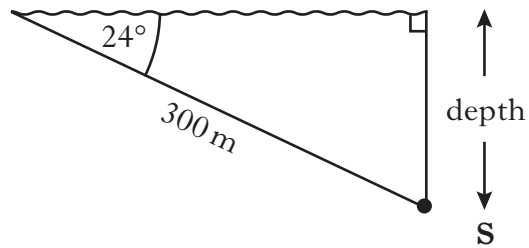


Marks

9. A submarine, **S**, dives for 300 metres at an angle of 24° to the surface.

Calculate the depth of the submarine as shown in the diagram.

Do not use a scale drawing.



3

[Turn over



Marks

10. Use the formula below to find the value of S when $n = 25$, $a = 1.5$, and $L = 6.3$.

$$S = \frac{n(a+L)}{2}$$

3

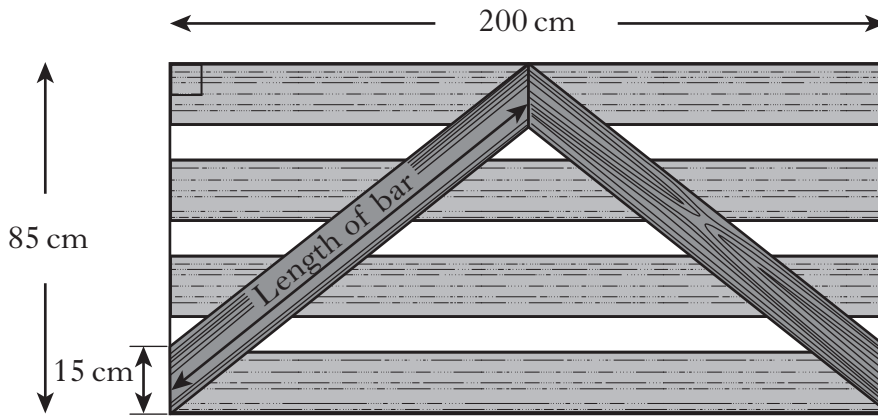
11. £4750 was invested in a savings account.
The rate of interest was 2.4% per annum.
How much interest was due after eight months?

3



Marks

12. A wooden gate is 85 centimetres high and 200 centimetres wide.
The gate is strengthened by two bars which meet half-way across the gate as shown.
The ends of each bar measure 15 centimetres.



Calculate the length of **one** of the bars.

Do not use a scale drawing.

4

[Turn over



Marks

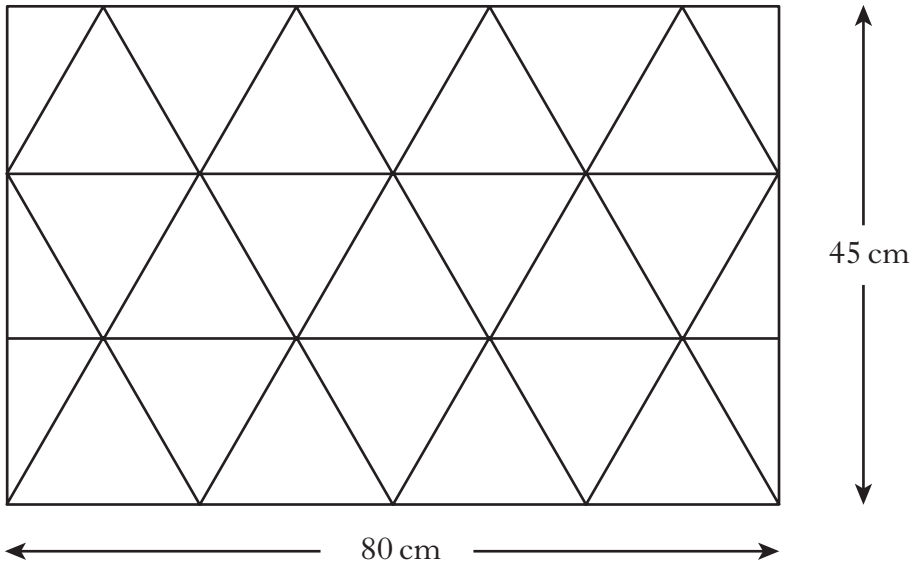
13. Azra bought a washing machine priced £350.
Including the delivery charge she paid a total of £371.
Express the delivery charge as a percentage of the price of the washing machine.

4



Marks

14. Part of a bathroom wall is covered with identical triangular tiles. Some tiles are cut in half.



Calculate the area of one complete triangular tile.

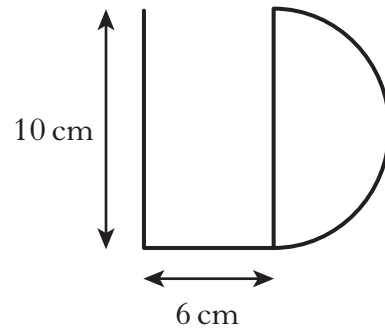
3

[Turn over



Marks

15. Lizzie Douglas bends a length of wire into the shape of her initials.



The letter D is a semi-circle.

Calculate the total length of the wire.

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

5

[END OF QUESTION PAPER]



ADDITIONAL SPACE FOR ANSWERS

DO NOT
WRITE IN
THIS
MARGIN

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ADDITIONAL SPACE FOR ANSWERS

DO NOT
WRITE IN
THIS
MARGIN

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* X 1 0 0 1 0 0 2 1 6 *