

FOR OFFICIAL USE

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Total mark

# X100/101

NATIONAL  
QUALIFICATIONS  
2007

TUESDAY, 15 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

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Scottish candidate number

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Number of seat

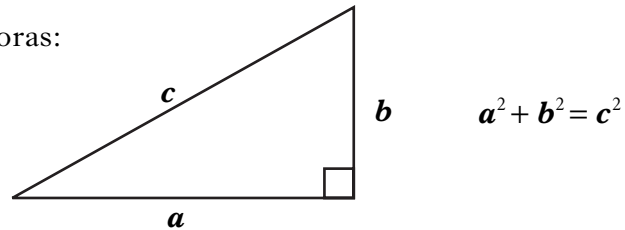
- 1 You may **NOT** use a calculator.
- 2 Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.
- 3 Full credit will be given only where 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.



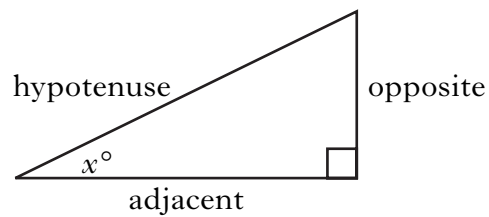
## FORMULAE LIST

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

Theorem of Pythagoras:



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

**ALL questions should be attempted.**

1. (a) Find  $8.52 + 10.7$ .

1

(b) Find  $3.76 \div 8$ .

1

(c) Change  $0.057$  into a fraction.

1

(d) Find  $90\%$  of  $\pounds 320$ .

2

2. Shona wants to insure her jewellery for  $\pounds 8000$ .

The insurance company charges an annual premium of  $\pounds 7.65$  for each  $\pounds 1000$  insured.

Work out Shona's annual premium.

2

Marks

3. Solve algebraically the inequality

$$7a + 6 < 69.$$

2

4. The number of minutes that patients had to sit in the waiting room before seeing their doctor was recorded one day.

The results are shown in the frequency table below.

Number of minutes	Frequency	Number of minutes $\times$ Frequency
5	4	20
6	7	42
7	8	56
8	13	104
9	12	
10	6	
	Total = 50	Total =

Complete the table above **and** find the mean number of minutes.

3

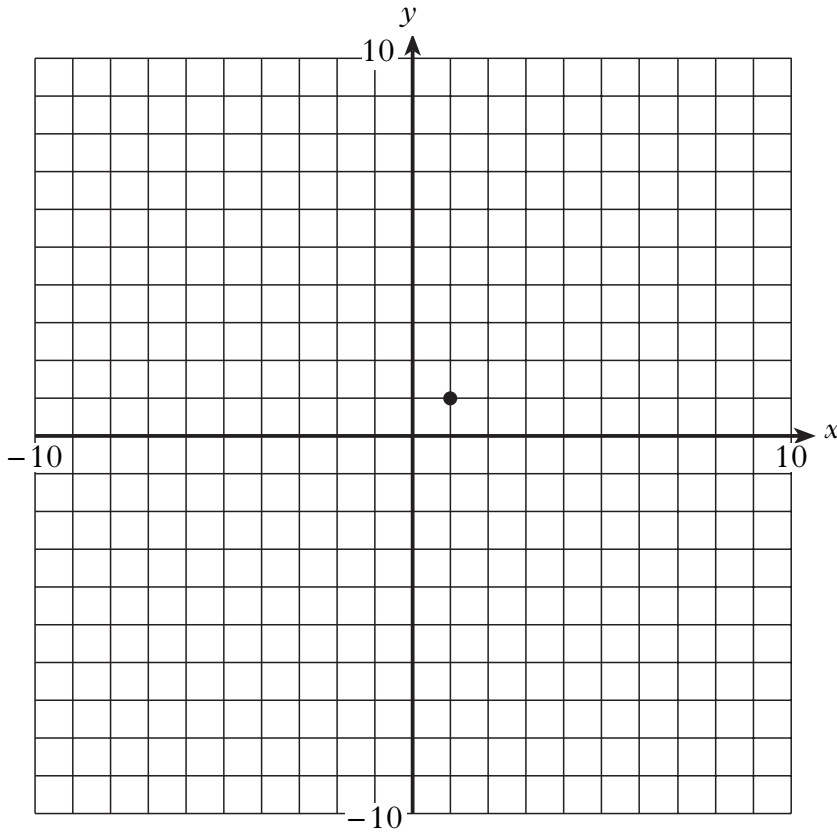
Marks

5. (a) Complete the table below for  $y = 4x - 3$ .

$x$	-1	0	1	3
$y$			1	

2

(b) Draw the line  $y = 4x - 3$  on the grid.

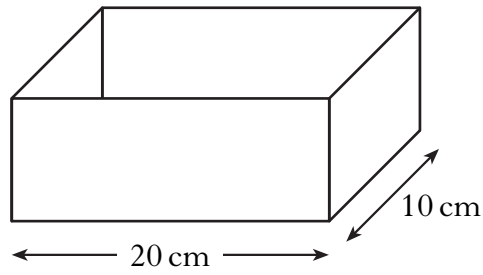


2

[Turn over

Marks

6. Shown below is a container in the shape of a cuboid.



When full, the container holds 1600 cubic centimetres of water.  
Work out the height of the container.

7. Work out the answers to the following.

(a)  $2 \times (-2) \times 2$

(b)  $11 - (-6)$

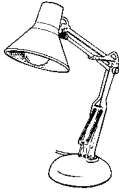
3

1

1

Marks

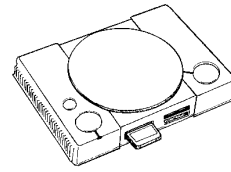
8. Naveed has six electrical appliances in his student lodgings.  
The power, in watts, used by each appliance is shown below.



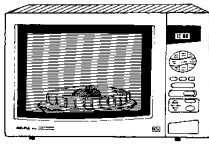
Lamp 100 watts



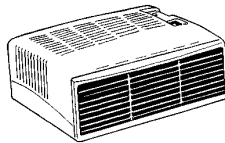
Computer 200 watts



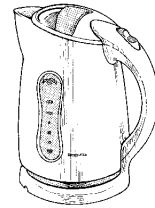
Games Machine  
400 watts



Microwave 700 watts

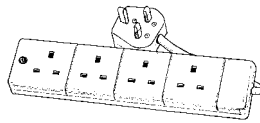


Heater 1000 watts



Kettle 2300 watts

Naveed uses a 4-way extension lead for the appliances.



The instructions state that the maximum power used through the extension lead should not be more than 3000 watts.

One combination of **four** appliances that Naveed can safely use through the extension lead is shown in the table below.

<i>Lamp</i>	<i>Computer</i>	<i>Games Machine</i>	<i>Microwave</i>	<i>Heater</i>	<i>Kettle</i>	<i>Total Watts</i>
100 watts	200 watts	400 watts	700 watts	1000 watts	2300 watts	
✓	✓	✓		✓		1700

Complete the table to show **all** the possible combinations of **four** appliances that Naveed can safely use through the extension lead.

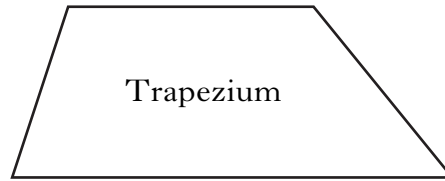
3

[Turn over for Questions 9 and 10 on Page eight

Marks

9. The formula for the area of a trapezium is

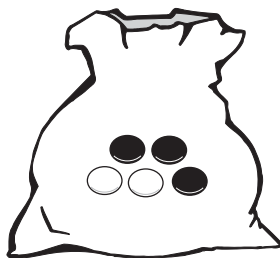
$$A = \frac{1}{2}h(a + b).$$



Find  $A$  when  $a = 11$ ,  $b = 7$  and  $h = 6$ .

3

10. Black and white counters are placed in two bags as shown below.



Bag 1



Bag 2

One counter is selected at random from **each** bag.

Which bag gives a greater probability of selecting a black counter?

**Explain your answer.**

3

[END OF QUESTION PAPER]



**ADDITIONAL SPACE FOR ANSWERS**

**ADDITIONAL SPACE FOR ANSWERS**

**ADDITIONAL SPACE FOR ANSWERS**

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