Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 3 – Section A (Calculator)

Higher Tier

Specimen Terminal Paper

Time: 1 hour 10 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 17 questions in this question paper. The total mark for this paper is 60.
There are 16 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, then take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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Turn over

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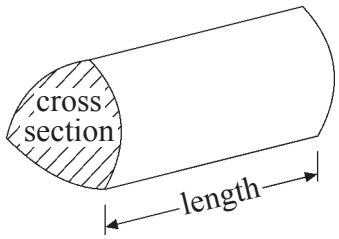
Formulae: Higher Tier

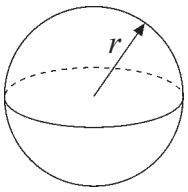
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



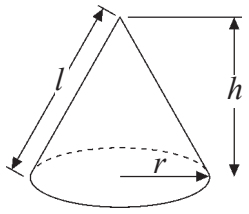
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

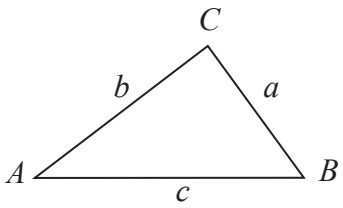


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Here is a list of ingredients for making some Greek food for **6** people.

2 cloves of garlic
4 ounces of chick peas
4 tablespoons of olive oil
5 fluid ounces of Tahina paste

Work out the amount of ingredients to make the Greek food for **9** people.

..... cloves of garlic

..... ounces of chick peas

..... tablespoons of olive oil

..... fluid ounces of Tahina paste

Q1

(Total 2 marks)

2. A regular polygon has an exterior angle of 20°

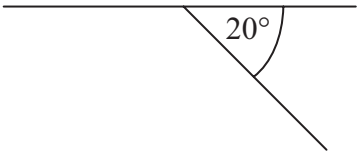


Diagram **NOT** accurately drawn

How many sides has this regular polygon?

.....

Q2

(Total 2 marks)

Leave blank

3. The heat setting number of a gas oven is called its Gas Mark.
This rule may be used to change a Gas Mark to a temperature in °C.

Gas Mark → × 14 → + 121 → Temperature in °C

Complete the formula for T, the temperature in °C, in terms of G, the Gas Mark.

$T =$ .....

Q3

(Total 2 marks)

4.

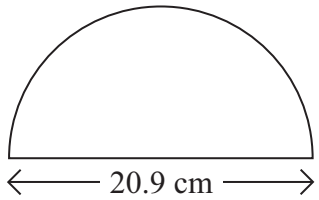


Diagram **NOT** accurately drawn

A semicircle has a diameter of 20.9 cm.

Work out the perimeter of the semicircle.
Give your answer to an appropriate degree of accuracy.

..... cm

Q4

(Total 4 marks)

Leave blank

5.

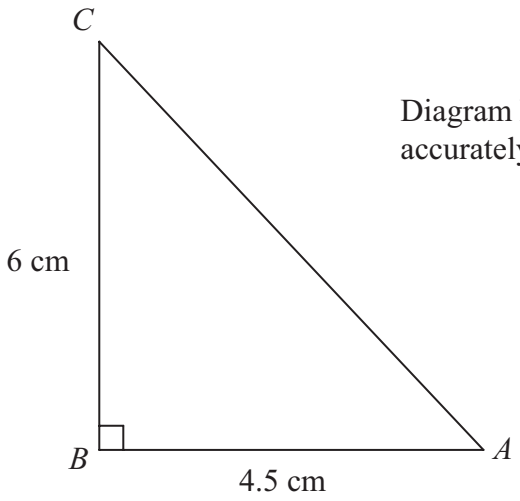


Diagram **NOT** accurately drawn

(a) Calculate the length of AC.

..... cm
(2)

(b) ABC is the side of a triangular prism of length 10cm.

Calculate the volume of the triangular prism.

..... cm
(3)

Q5

(Total 5 marks)

6. Simplify $3x^3y^2 \times x^2y^3$

.....

Q6

(Total 2 marks)

Leave blank

7. The equation

$$x^3 + x = 37$$

has a solution between 3 and 4
Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show **ALL** your working.

$x =$ .....

(Total 4 marks)

Q7

8. The table shows some expressions.
a, b, c and *d* represent lengths.
π and 3 are numbers which have no dimensions.

$3a^2$	$\frac{\pi ab^3}{3d}$	πbc	$ac + bd$	$\pi(a + b)$	$3(c + d)^3$	$3\pi bc^2$

Tick (✓) the boxes underneath the **three** expressions which could represent volumes.

(Total 3 marks)

Q8

Leave blank

9. A company gives a discount of $7\frac{1}{2}$% off invoices that are paid within 3 weeks.
An invoice for £84 was paid within 3 weeks.

(a) How much was paid?

£ .....
(3)

The company bought a van that had a value of £12 000
Each year the value of the van depreciates by 25%

(b) Work out the value of the van at the end of three years.

£ .....
(3)

The company bought a new truck.
Each year the value of the truck depreciates by 20%
The value of the new truck can be multiplied by a number to find its value at the end of four years.

(c) Find this number as a decimal.

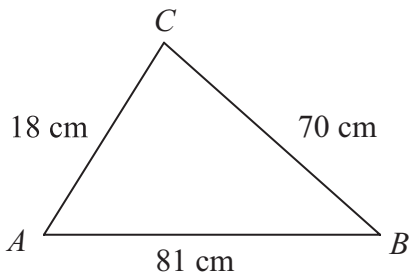
.....
(2)

Q9

(Total 8 marks)

Leave blank

10. Triangle *ABC* is similar to triangle *DEF*.
Angle *BAC* = angle *EDF*.



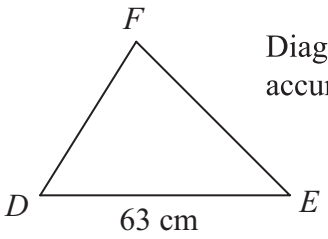


Diagram **NOT** accurately drawn

In triangle *ABC*, *AB* = 81 cm, *BC* = 70 cm, *AC* = 18 cm.
In triangle *DEF*, *DE* = 63 cm.

(a) Calculate the length of *DF*.

..... cm
(2)

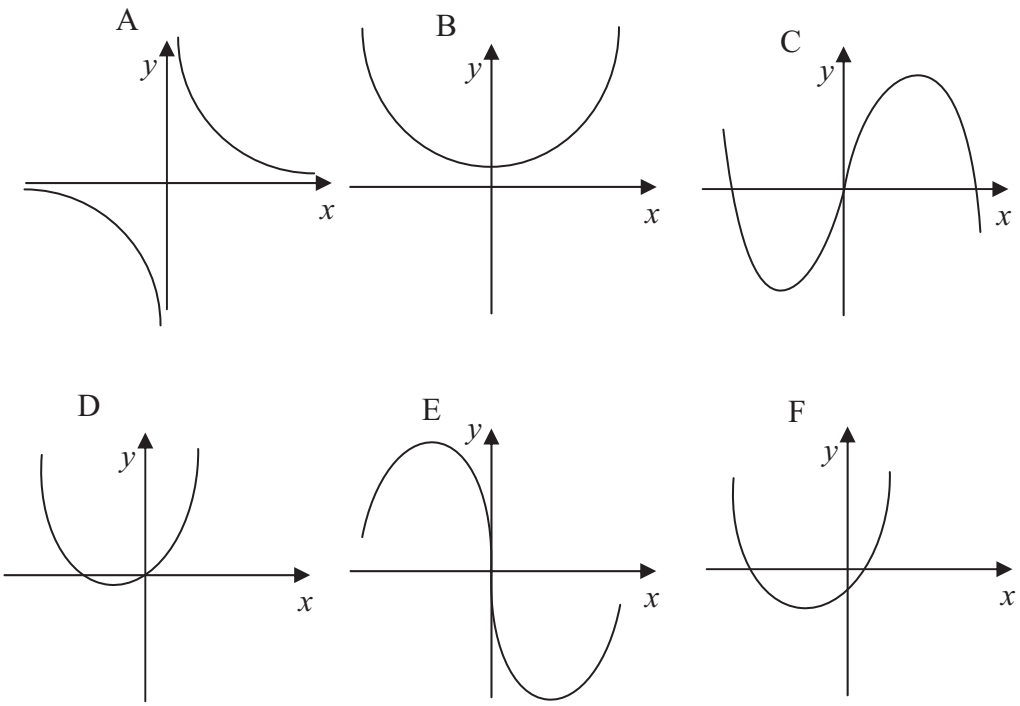
(b) Calculate the size of angle *BAC*.
Give your answer correct to 1 decimal place.

..... °
(3) **Q10**

(Total 5 marks)

Leave blank

11.



Each of the equations in the table represents one of the graphs *A* to *F*.

Write the letter of each graph in the correct place in the table.

Equation	**Graph**
$y = x^2 + 3x$	
$y = x - x^3$	
$y = x^3 - 2x$	
$y = x^2 + 2x - 4$	
$y = \frac{4}{x}$	
$y = x^2 + 3$	

Q11

(Total 3 marks)

Leave blank

12. Solve the inequality $5x + 7 \leqslant 3x + 14$

.....

(Total 2 marks)

Q12

13. Use your calculator to work out

$$\frac{27.2 - 8.35}{\sqrt{9.7 + 3.26}}$$

Write down all the figures on your calculator display.

.....

(Total 2 marks)

Q13

Leave blank

14. The number 1998 can be written as $2 \times 3^n \times p$, where n is a whole number and p is a prime number.

(a) Work out the value of n and the value of p.

$n =$ .....

$p =$ .....

(2)

(b) Using your answers to part (a), or otherwise, find the factor of 1998 which is between 100 and 200

.....

(1)

Q14

(Total 3 marks)

15. Evaluate $\left(2+\sqrt{5}\right)^2$, writing your answer in the form $a+b\sqrt{5}$

.....

Q15

(Total 2 marks)

Leave blank

16. Fred cycled from home to his friend's house and back again.
The distance from Fred's home to his friend's house is 20 km.
On his way from home to his friend's house, Fred cycled at x km per hour.
On his way back, Fred's speed had decreased by 2 km per hour.
It took Fred 4 hours altogether to cycle to his friend's house and back.

(a) Write down an equation for x.

.....

(2)

(b) Show that the equation can be written as

$$x^2 - 12x + 10 = 0$$

(2)

(c) Solve the equation in part (b).
Give your answers correct to 1 decimal place.

.....

(3)

Only one of the answers in part (c) can be Fred's speed.

(d) Explain why.

.....

.....

(1) **Q16**

(Total 8 marks)

Leave blank

17. Two similar tins have heights 12 cm and 20 cm.
The volume of the smaller tin is 162 cm^3.

Calculate the volume, in cm^3, of the larger tin.

..... cm^3 **Q17**

(Total 3 marks)

TOTAL FOR SECTION A: 60 MARKS

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