

GCSE

**Mathematics: Non-Calculator**

Paper 6

Specification EDEXCEL A

Name

**Time allowed**

- 30 minutes.

**For this paper you must have**

- A ballpoint pen with black ink.
- A ruler with millimetre measurements.

**Instructions**

- Do all rough work in this question booklet.
- Answer **all** the questions.
- You **must** show your working for all questions.

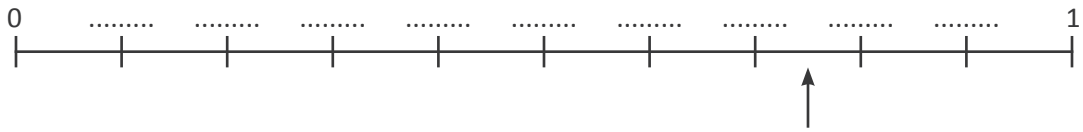
The maximum mark for this paper is 40.

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

**Grade Boundaries**

A\* 34  
A 29  
B 22  
C 15  
D 8

1. Here is a number line.



(a) Complete the number line by writing numbers in the appropriate spaces. (1 mark)

(b)(i) Write down the number represented by the arrow.

Answer ..... (1 mark)

(ii) Show the inequality  $x < 0.3$  on the number line. (2 marks)

2. Solve the following equations.

(a)  $4 + x = 11$

$x = \dots\dots\dots$  (1 mark)

(b)  $8(5 - x) = 2x$

$x = \dots\dots\dots$  (2 marks)

(c)  $3^{(5x - 8)} = 3^7$

$x = \dots\dots\dots$  (2 marks)

3. Find the coordinates of the point where the lines  $y = 3x - 1$  and  $2y = 5 - x$  intersect.

\_\_\_\_\_ ( ..... , ..... ) (4 marks)

4. There are two lighthouses, **A** and **B**.  
Lighthouse **A** flashes a light once every 16 seconds. Lighthouse **B** flashes a light once every 20 seconds.

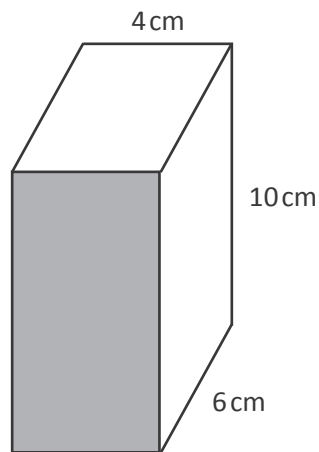
**Both lighthouses flashed their lights 12 seconds ago.**

How long will it be **from now** until the two lighthouses flash their lights at the same time again?

\_\_\_\_\_ (4 marks)

Turn over for Question 5 ►

5. Guy has a milk carton.  
The carton is in the shape of a cuboid.



The carton has the dimensions shown.  
Milk fills the carton to a depth of 4 cm.

Guy turns the carton so that it now lies on the shaded face.  
Calculate the depth of the milk now.

..... cm (3 marks)

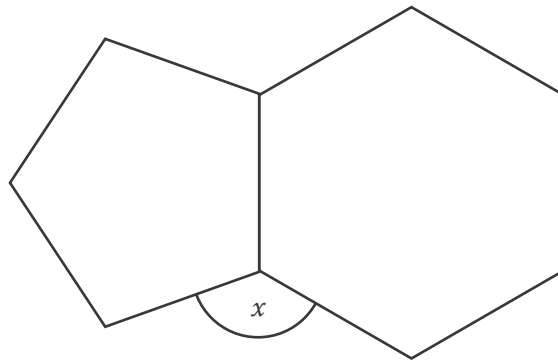
6. Here are two expressions.  
 $x$  and  $y$  represent lengths and numbers have no dimensions.  
Complete the table by putting a tick in each column to show whether each expression represents a length, area, volume or none of these.

	$3\pi(x + y)$	$x^3(y + 4) \div x$
Length		
Area		
Volume		
None of these		

(2 marks)

7. (a) The diagram shows a regular pentagon and a regular hexagon.

Not drawn accurately



Calculate the size of the angle marked  $x$ .

$x = \dots\dots\dots$

(4 marks)

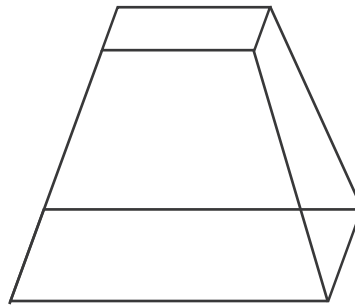
(b) More regular polygons are added in such a way that the next added polygon has seven sides and the one after has eight sides. Given that each added polygon has one more sides than the one before it, write down how many sides the 100th polygon will have.

$\dots\dots\dots$  sides

(1 mark)

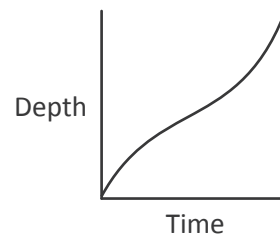
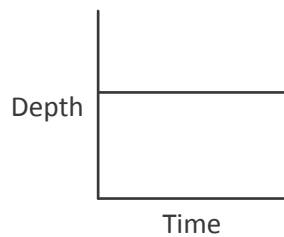
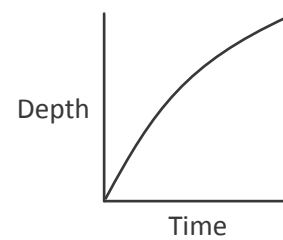
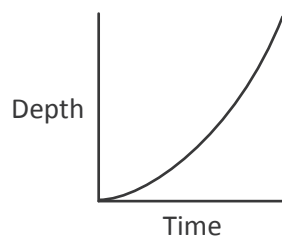
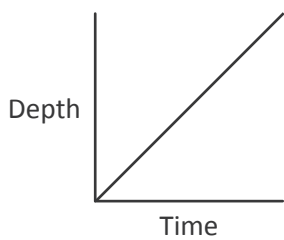
Turn over for Question 8 ►

8. The diagram shows a water tank.



Water is poured into the tank at a constant rate from a hole at the top.

Each of the graphs below show a relationship between depth of water and time.



- (a) Draw a ring around the graph which correctly shows the relationship between depth of water and time for the water tank shown. (1 mark)

- (b) The water is poured into the tank at a rate of  $1\text{ cm}^3\text{s}^{-1}$ .  
Given that it takes 4 minutes to completely fill the tank, calculate the volume of the tank.

.....  $\text{cm}^3$  (2 marks)

9. Given that  $(2x + 5)(ax + b)$  can be expressed in the form  $2x^2 + x + c$ , work out the values of  $a$ ,  $b$  and  $c$ .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

$c = \dots\dots\dots$

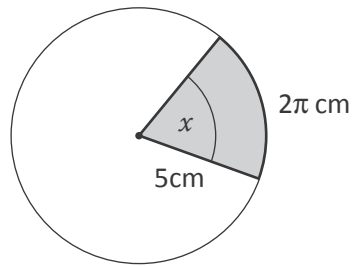
*(4 marks)*

Turn over for Question 10 ►

10.

Here is a circle.

The radius of the circle is 5 cm and the length of the arc shown is  $2\pi$  cm.



(a) Show that the value of  $x$  is  $72^\circ$ .

\_\_\_\_\_ (3 marks)

(b) Calculate the area of the sector shaded in the diagram, giving your answer in terms of  $\pi$ .

Answer ..... (3 marks)

**END OF QUESTIONS**