

Write your name here

Surname

Other names

In the style of:

**Edexcel GCSE**

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

# Mathematics A

## Transformation of Curves

Higher Tier

Past Paper Style Questions  
Arranged by Topic

Paper Reference

**1MA0/1H**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- **Calculators must not be used.**



### Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed.

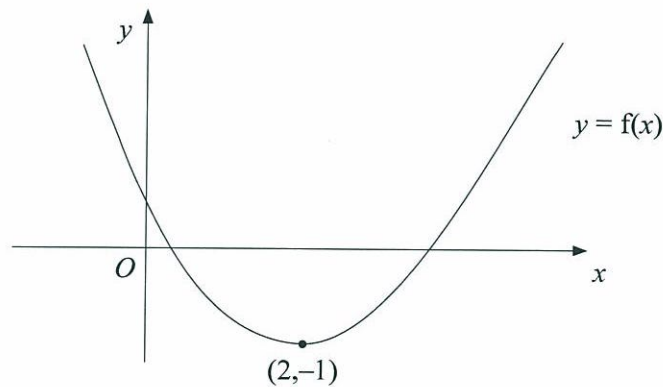
### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►



1.



The diagram shows part of the curve with equation  $y = f(x)$

The minimum point of the curve is at  $(2, -1)$

(a) Write down the coordinates of the minimum point of the curve with equation

(i)  $y = f(x - 2)$

$(4, -1)$   
.....

(ii)  $y = 2f(x)$

$(2, -2)$   
.....

(iii)  $y = f(2x)$

$(1, -1)$   
.....

(3)

The curve  $y = f(x)$  is reflected in the  $y$  axis.

(b) Find the equation of the curve following this transformation.

$y = f(-x)$   
.....  
(1)

The curve with equation  $y = f(x)$  has been transformed to give the curve with equation  $y = f(x) + 2$

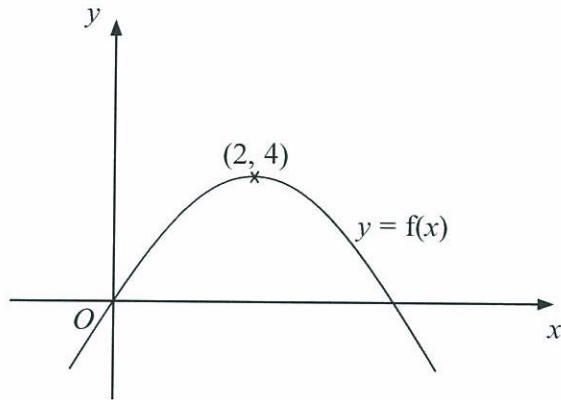
(c) Describe the transformation.

A translation of  $f(x)$  by 2 units along the positive  
.....  
 $y$ -axis.  
(1)

(Total 5 marks)



2.



The diagram shows part of the curve with equation  $y = f(x)$ .  
The coordinates of the maximum point of this curve are  $(2, 4)$ .

Write down the coordinates of the maximum point of the curve with equation

(a)  $y = f(x - 2)$

(4 , 4)  
(1)

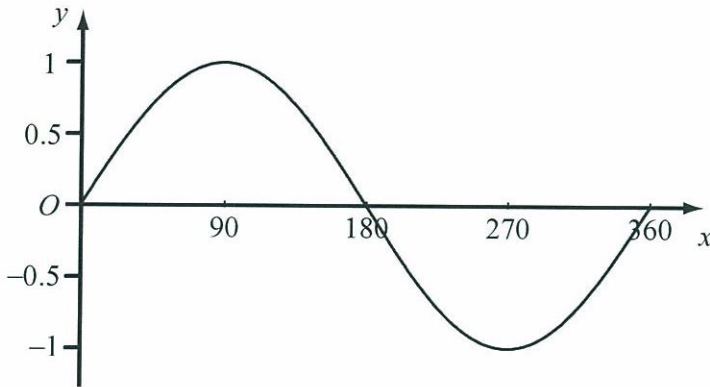
(b)  $y = 2f(x)$

(2 , 8)  
(1)

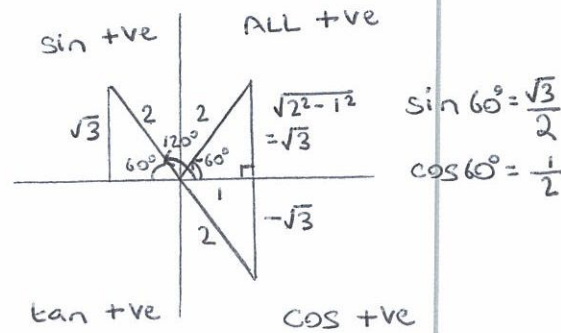
(Total 2 marks)



3. The diagram shows a sketch of the curve  $y = \sin x^\circ$  for  $0 \leq x \leq 360$



QUADRANT GUIDE TO ILLUSTRATE WHERE TRIGONOMETRIC RATIOS ARE POSITIVE (+ve).



The exact value of  $\sin 60^\circ = \frac{\sqrt{3}}{2}$

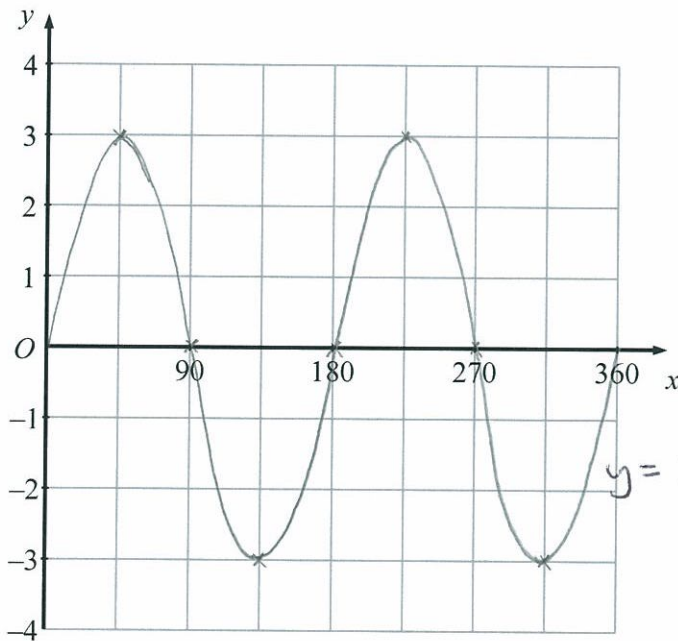
(a) Write down the exact value of

- (i)  $\sin 120^\circ$ ,  $\sin \alpha = \sin(180 - \alpha)$   
 $\Rightarrow \sin 60^\circ = \sin(180 - 60)$   
 $= \sin 120^\circ = \frac{\sqrt{3}}{2}$
- (ii)  $\sin 300^\circ$ .

$\sin \alpha \equiv -\sin(360 - \alpha)$   
 $\Rightarrow \sin 300^\circ \equiv -\sin(360 - 300) = -\sin 60^\circ = -\frac{\sqrt{3}}{2}$

$\frac{\sqrt{3}}{2}$   
 .....  
 $-\frac{\sqrt{3}}{2}$   
 .....  
 (2)

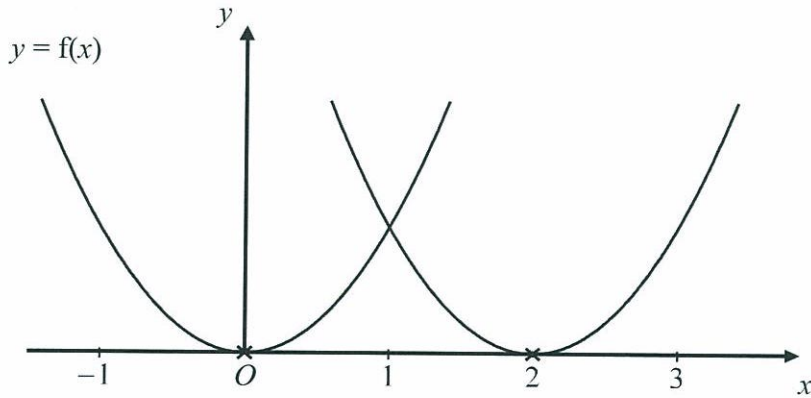
(b) On the grid below, sketch the graph of  $y = 3 \sin 2x^\circ$  for  $0 \leq x \leq 360$



(2)



4.

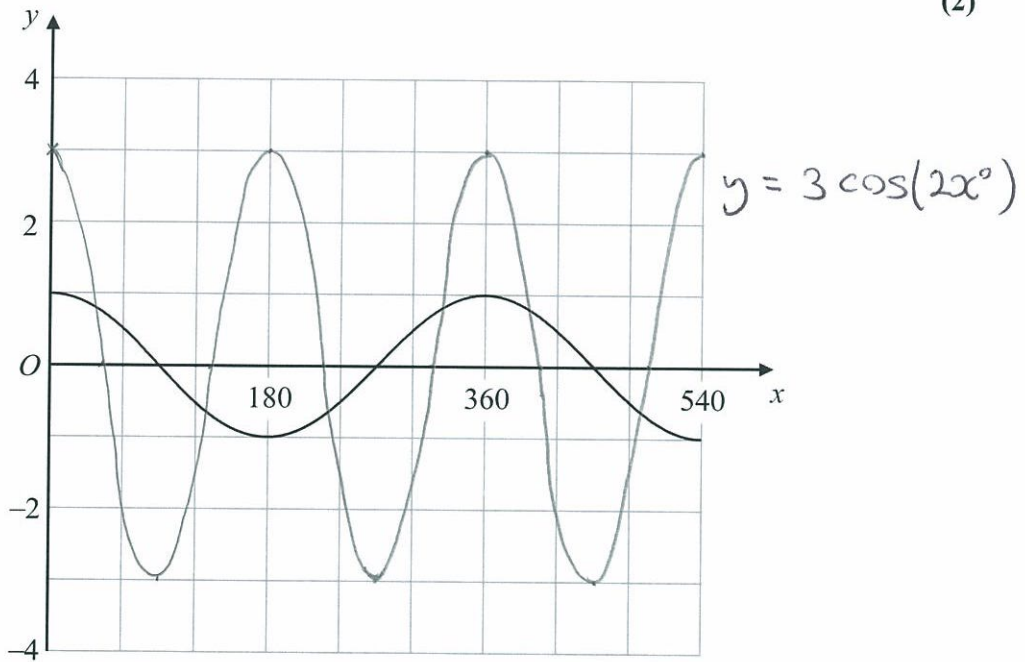


The curve with equation  $y = f(x)$  is translated so that the point at  $(0, 0)$  is mapped onto the point  $(2, 0)$ .

(a) Find an equation of the translated curve.

$$y = f(x - 2)$$

(2)



The grid shows the graph of  $y = \cos x^\circ$  for values of  $x$  from 0 to 540

(b) On the grid, sketch the graph of  $y = 3 \cos(2x^\circ)$  for values of  $x$  from 0 to 540

(2)

(Total 4 marks)

