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

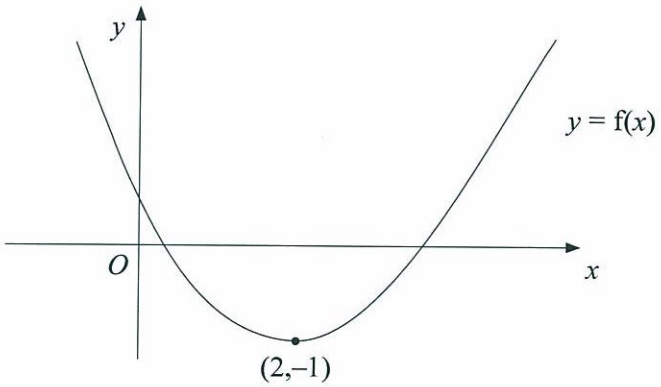
- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

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 $y = f(x) + 2$

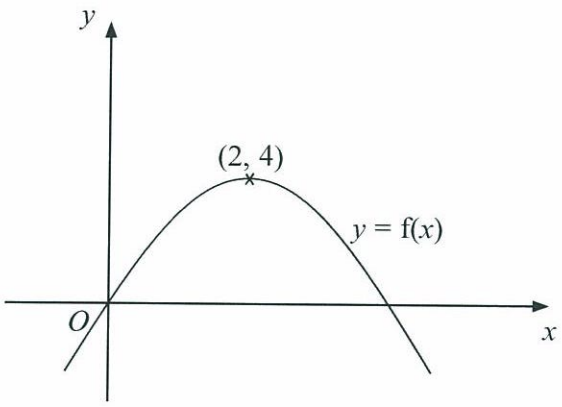
(c) Describe the transformation.

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, ~~3~~ 4).

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

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

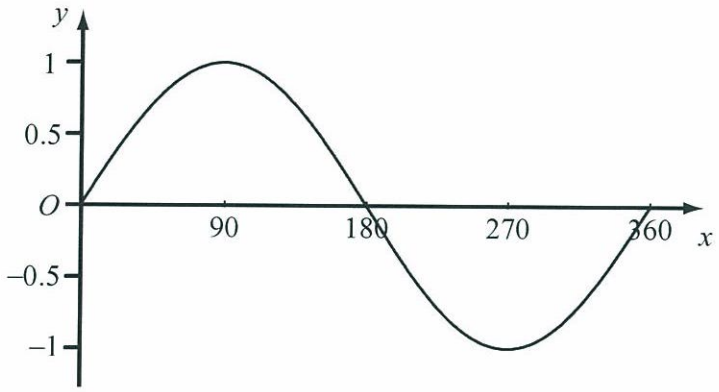
(4 , 4)
(1)

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

(2 , 8)
(1)

(Total 2 marks)

3. The diagram shows a sketch of the curve $y = \sin x°$ for $0 \leqslant x \leqslant 360$



The exact value of $\sin 60° = \dfrac{\sqrt{3}}{2}$

(a) Write down the exact value of

(i) $\sin 120°$,

$\sin x = \sin(180 - x)$

$\Rightarrow \sin 60° = \sin(180 - 60)$

$= \sin 120° = \dfrac{\sqrt{3}}{2}$

$\dfrac{\sqrt{3}}{2}$ .....

(ii) $\sin 300°$.

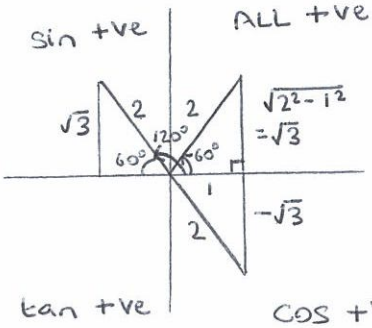
$\sin x \equiv -\sin(360 - x)$

$\Rightarrow \sin 300° \equiv -\sin(360 - 300) = -\sin 60° = -\dfrac{\sqrt{3}}{2}$

$-\dfrac{\sqrt{3}}{2}$ .....

(2)

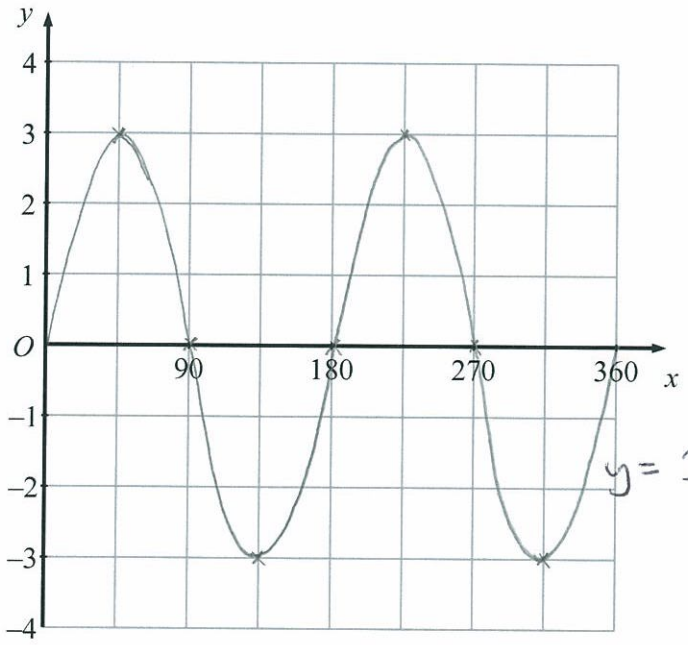
QUADRANT GUIDE TO ILLUSTRATE WHERE TRIGONOMETRIC RATIOS ARE POSITIVE (+ve).



$\sin 60° = \dfrac{\sqrt{3}}{2}$

$\cos 60° = \dfrac{1}{2}$

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

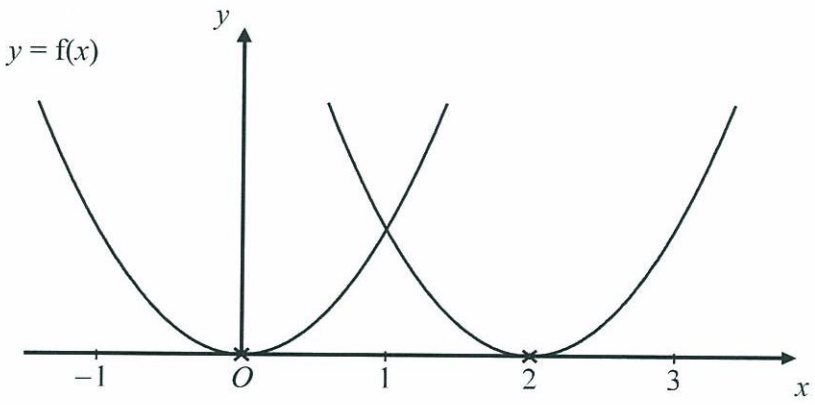


$y = 3 \sin 2x°$

(2)

(Total 4 marks)

4.



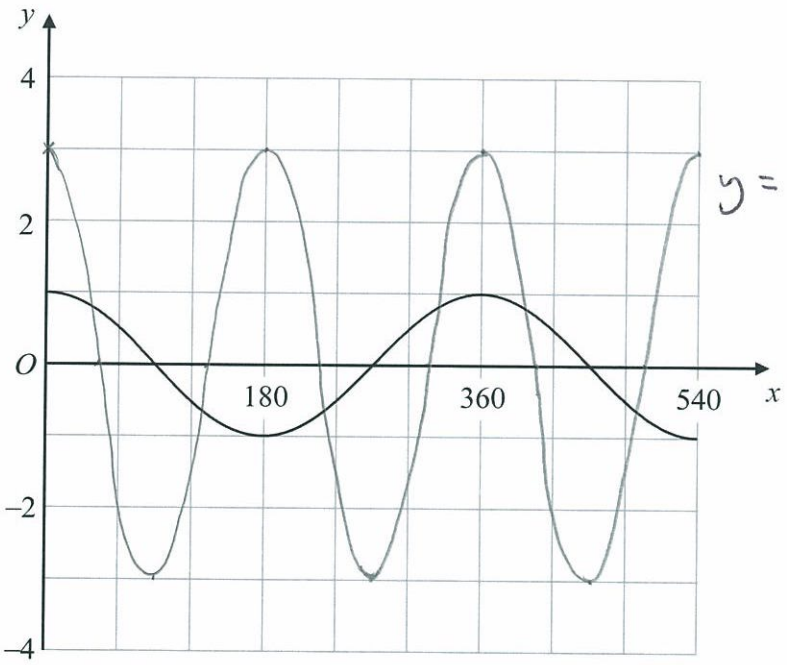
The curve with equation $y = f(x)$ is translated so that the point at (0, 0) is mapped onto the point (2, 0).

(a) Find an equation of the translated curve.

$y = f(x-2)$

.....

(2)



$y = 3\cos(2x°)$

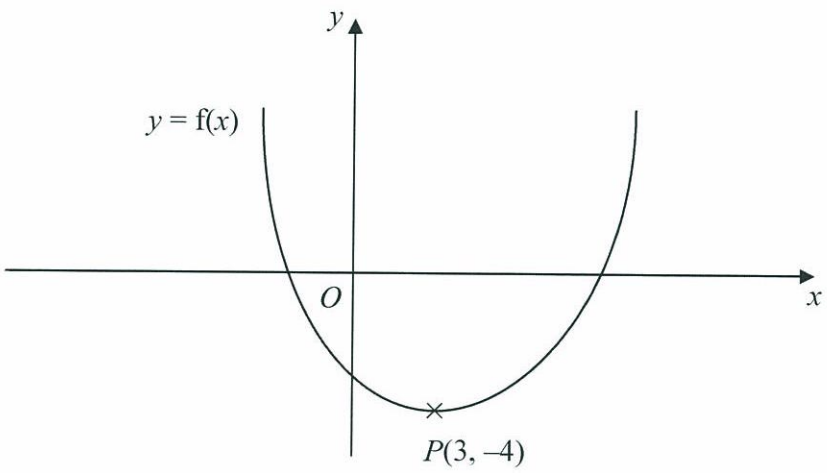
The grid shows the graph of $y = \cos x°$ for values of x from 0 to 540

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

(2)

(Total 4 marks)

5. This is a sketch of the curve with the equation $y = f(x)$.
The only minimum point of the curve is at $P(3, -4)$.



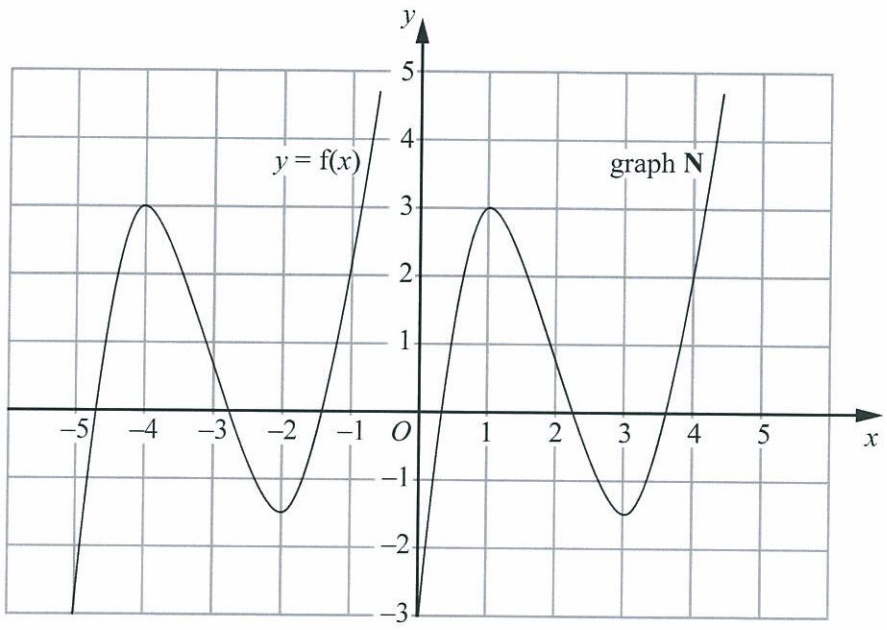
(a) Write down the coordinates of the minimum point of the curve with the equation $y = f(x - 2)$

(5 , -4)
(2)

(b) Write down the coordinates of the minimum point of the curve with the equation $y = f(x + 5) + 6$

(-2 , 2)

6. The graph of $y = f(x)$ is shown on the grid.



The graph N is a translation of the graph of $y = f(x)$.

(a) Write down in terms of f, the equation of graph N

$y =$ f(x − 5)

(1)

The graph of $y = f(x)$ has a maximum point at $(-4, 3)$.

(b) Write down the coordinates of the maximum point of the graph of $y = f(-x)$.

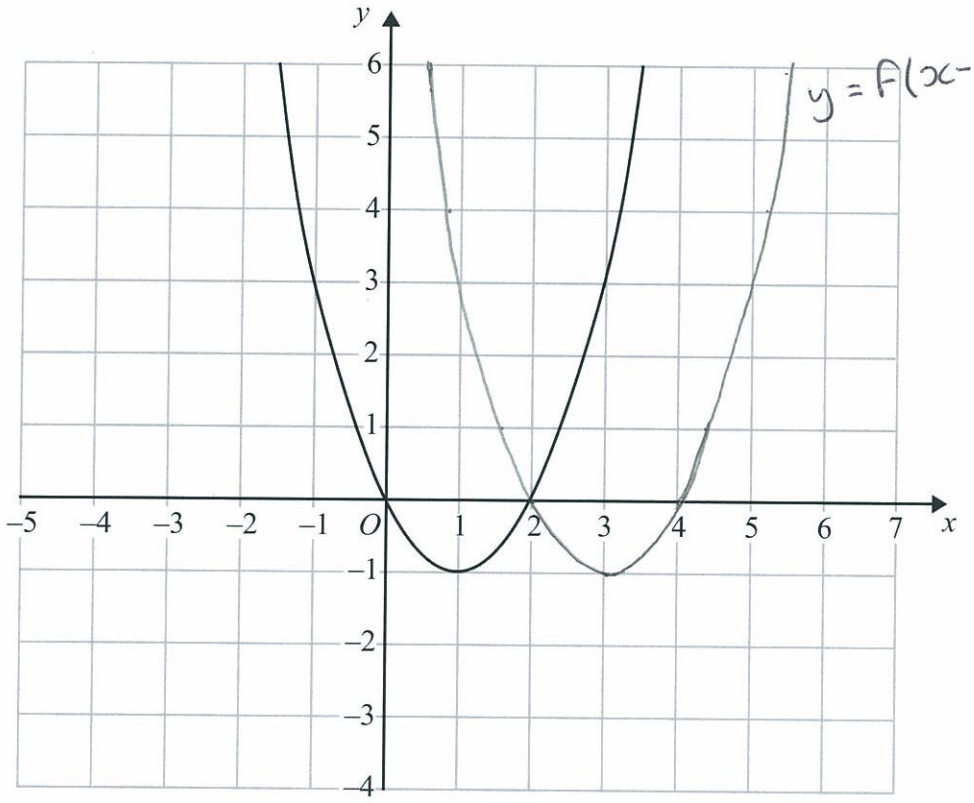
(4 , 3)

(2)

(Total 3 marks)

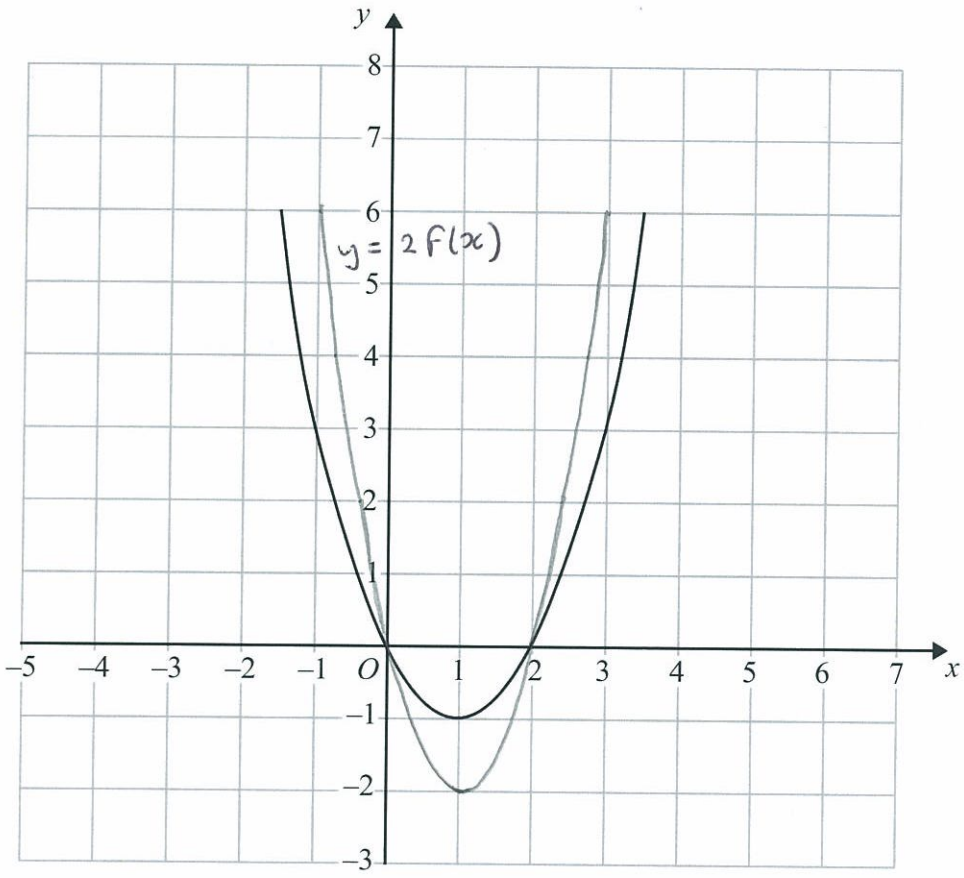
7. The graph of $y = f(x)$ is shown on each of the grids.

(a) On this grid, sketch the graph of $y = f(x - 2)$



(2)

(b) On this grid, sketch the graph of $y = 2f(x)$



(Total 4 marks)

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