**www.m4ths.com - A Level Maths**
**3 Exam Questions**
**Yr 1 – Graphs**

(1) (a) Fully factorise $-x^3 - x^2$

(b) Hence sketch the graph of

$$y = -x^3 - x^2$$

showing any points where the curve meets or crosses the coordinate axes.

(c) Hence, sketch the curve of

$y = -(x-1)^3 - (x-1)^2 \ + 2$

stating where the curve crosses the $y$ axis.

(2) Sketch the graph of

$$y = \frac{1}{x-3} + 4, \ \ x \neq 3$$

showing any points where the curve meets or crosses the coordinate axes and the equations of any asymptotes.

(3) Given that $\mathrm{f}(x) = 2x^4 - 1$ and $\mathrm{g}(x) = (4 - x^2)$

(a) Sketch the graphs of $y = \mathrm{f}(x)$ and $y = \mathrm{g}(x)$ on the same set of axes, showing any points where the curves cross the coordinate axes.

(b) State the number of real solutions to the equation

$$2x^4 = (4 - x^2)$$

(c) Given that $\mathrm{f}(x) + k = \mathrm{g}(x)$ has no real solutions, find the set of values for which $k$ is valid.

**www.m4ths.com - A Level Maths**
**3 Exam Questions**
**Yr 1 – Graphs**

(1) (a) Fully factorise $-x^3 - x^2$

(b) Hence sketch the graph of

$$y = -x^3 - x^2$$

showing any points where the curve meets or crosses the coordinate axes.

(c) Hence, sketch the curve of

$y = -(x-1)^3 - (x-1)^2 \ + 2$

stating where the curve crosses the $y$ axis.

(2) Sketch the graph of

$$y = \frac{1}{x-3} + 4, \ \ x \neq 3$$

showing any points where the curve meets or crosses the coordinate axes and the equations of any asymptotes.

(3) Given that $\mathrm{f}(x) = 2x^4 - 1$ and $\mathrm{g}(x) = (4 - x^2)$

(a) Sketch the graphs of $y = \mathrm{f}(x)$ and $y = \mathrm{g}(x)$ on the same set of axes, showing any points where the curves cross the coordinate axes.

(b) State the number of real solutions to the equation

$$2x^4 = (4 - x^2)$$

(c) Given that $\mathrm{f}(x) + k = \mathrm{g}(x)$ has no real solutions, find the set of values for which $k$ is valid.

**www.m4ths.com - A Level Maths**
**3 Exam Questions**
**Yr 1 – Graphs**

(1) (a) Fully factorise $-x^3 - x^2$

(b) Hence sketch the graph of

$$y = -x^3 - x^2$$

showing any points where the curve meets or crosses the coordinate axes.

(c) Hence, sketch the curve of

$y = -(x-1)^3 - (x-1)^2 \ + 2$

stating where the curve crosses the $y$ axis.

(2) Sketch the graph of

$$y = \frac{1}{x-3} + 4, \ \ x \neq 3$$

showing any points where the curve meets or crosses the coordinate axes and the equations of any asymptotes.

(3) Given that $\mathrm{f}(x) = 2x^4 - 1$ and $\mathrm{g}(x) = (4 - x^2)$

(a) Sketch the graphs of $y = \mathrm{f}(x)$ and $y = \mathrm{g}(x)$ on the same set of axes, showing any points where the curves cross the coordinate axes.

(b) State the number of real solutions to the equation

$$2x^4 = (4 - x^2)$$

(c) Given that $\mathrm{f}(x) + k = \mathrm{g}(x)$ has no real solutions, find the set of values for which $k$ is valid.