**4A Sketching Cubic Graphs**



1. Sketch the graph of the function:

 $y=\left(x-2\right)\left(x-1\right)(x+1)$

x

y

1. Sketch the graph of the function:

 $y=\left(x-2\right)\left(1-x\right)(x+1)$

x

y

1. Sketch the graph of the function:

 $y=\left(x-1\right)^{2}(x+1)$

x

y

1. Sketch the graph of the function:

$$y=\left(x-1\right)\left(x^{2}+x+2\right)$$

x

y

**4B Sketching Quartic Graphs**

1. Sketch the curve:

$$y=\left(x+1\right)\left(x+2\right)\left(x-1\right)\left(x-2\right)$$

x

y

1. Sketch the curve:

$$y=x\left(x+2\right)^{2}(3-x)$$

x

y

1. Sketch the curve:

$$y=\left(x-1\right)^{2}\left(x-3\right)^{2}$$

x

y

**4C Sketching Reciprocal Graphs**

1. Sketch the graph:

$$y=\frac{3}{x}$$

x

y

1. Sketch the graph:

$$y=-\frac{1}{x}$$

x

y

1. Sketch the graph:

$$y=\frac{1}{x^{2}}$$

x

y

**4D Intersecting Graphs**

1. On the same diagram, sketch the following curves:

$y=x\left(x-3\right) $ and $y=x^{2}\left(1-x\right)$

x

y

1. Find the co-ordinates of the points of intersection
2. On the same diagram, sketch the following curves:

$y=\frac{3}{x}$ and $y=x^{2}\left(x-1\right)$

x

y

1. Explain how the graph shows that the following equation has 2 solutions

**4E Translating Graphs**

1. Sketch the following graphs:
2. $y=x^{2}$
3. $y=\left(x-2\right)^{2}$
4. $y=x^{2}+2$

x

y

1. Given that $f\left(x\right)=x^{3}$ and $g\left(x\right)=x\left(x-2\right)$,

sketch the graphs of $y=f\left(x+1\right)$ and $y=g(x+1)$

x

y

x

y

1. Given that $h\left(x\right)=\frac{1}{x}$, sketch the curve with equation $y=h\left(x\right)+1$, stating the equations of any asymptotes and intersections with the axes

x

y

**4F Stretching Graphs**

1. Given that $f\left(x\right)=9-x^{2}$, sketch the curves with equations:
2. $y=f(2x)$
3. $y=2f(x)$

x

y

x

y

x

y

1. Sketch the curve with equation $y=x(x-2)(x+1)$

x

y

1. Hence, sketch the curve $y=2x(2x-2)(2x+1)$

x

y

1. Based on your sketch in a), also sketch the curve $y=-x(x-2)(x+1)$

x

y

1. On the same set of axes, draw the graphs of $y=f(x)$, $y=f(-x)$ and

$y=-f(x)$ where $f\left(x\right)=x(x+2)$

x

y

**4G Unfamiliar Functions**

1. The diagram to the right shows a sketch of the curve $f(x)$ which passes through the origin. The points $A(1,4)$ and $B(3,1)$ also lie on the curve.

y

x

(1,4)

(3,1)

$$f(x)$$

1. Sketch the graph of $y=f(x+1)$

y

x

1. Sketch the graph of $y=f(x-1)$

y

x

1. Sketch the graph of $y=f\left(x\right)-4$

y

x

1. Sketch the graph of $2y=f(x)$

y

x