Graph Sketching Questions

1 Sketch and label each pair of graphs on the same set of axes showing the coordinates of any points where the graphs intersect. Write down the equations of any asymptotes.

a $y = x^2$ and $y = x^3$

b $y = x^2$ and $y = x^4$

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

d $y = x$ and $y = \sqrt{x}$

e $y = x^2$ and $y = 3x^2$

f $y = \frac{1}{x}$ and $y = \frac{2}{x}$

2 $f(x) = (x - 1)(x - 3)(x - 4)$.

a Find $f(0)$.

b Write down the solutions of the equation $f(x) = 0$.

c Sketch the curve $y = f(x)$.

3 Sketch each graph showing the coordinates of any points of intersection with the coordinate axes.

a $y = (x + 1)(x - 1)(x - 3)$

b $y = 2x(x - 1)(x - 5)$

c $y = -(x + 2)(x + 1)(x - 2)$

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

e $y = 3x(2 + x)(1 - x)$

f $y = (x + 2)(x - 1)^2$

4 **a** Factorise fully $x^3 + 6x^2 + 9x$.

b Hence, sketch the curve $y = x^3 + 6x^2 + 9x$, showing the coordinates of any points where the curve meets the coordinate axes.