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A LEVEL MATHS

(20) Quartic Graphs

WORKING AT D/E

(1) Sketch the graph of

$y = (x - 1)(x + 2)(x - 3)(x - 5)$ showing where the curve crosses the coordinate axes.

(2) Sketch the graph of

$y = (x + 3)(x - 2)(x + 6)(3 - x)$ showing where the curve crosses the coordinate axes.

(3) Sketch the graph of

$y = (x + 2)^4$ showing where the curve crosses the coordinate axes.

WORKING AT B/C

(1) Sketch the graph of

$y = -x(x + 2)(x - 3)(x - 5)$ showing where the curve crosses the coordinate axes.

(2) (a) Show that $x^4 - x^2$ can be written as $x^2(x + 1)(x - 1)$

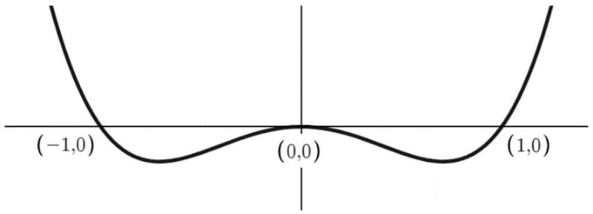
(b) Hence, draw the graph of $y = x^4 - x^2$ showing where the curve meets or crosses the coordinate axes.

(3) Sketch the graph of

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

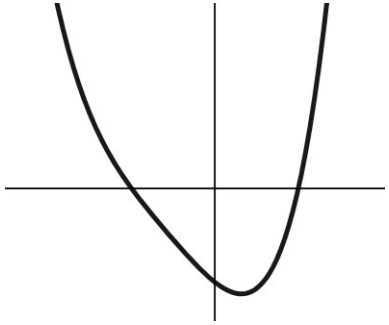
WORKING AT A*/A

(1) The diagram below shows part of the graph with equations $y = x^4 + bx^3 + cx^2 + dx + e$



Find the values of the constants b, c, d and e.

(2) The diagram below shows part of a graph of a quartic equation. All the roots to the equation are shown.



Write a **possible** equation for the graph.