



SKETCHING POLYNOMIAL GRAPHS | KEY POINTS

The graphs of polynomials are smooth curves. You need to know the typical shapes of these functions.

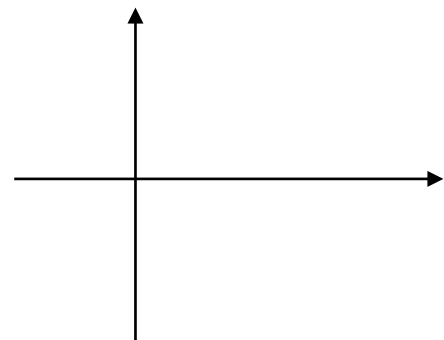
To sketch the graph of a polynomial function:

- Determine the **order** of the polynomial and the **sign of the leading coefficient**.
 - The **leading coefficient** is the coefficient of the term with the largest power.
- Identify the **y-intercept**: Set $x = 0$.
- Identify the **x-intercept(s)**: Set $y = 0$
 - Often, the factorised form helps with this.
- Determine the number of **turning points** and how the curve meets the x -axis (consider any **repeated roots**).
- Once you have all the information, draw a **smooth curve**.

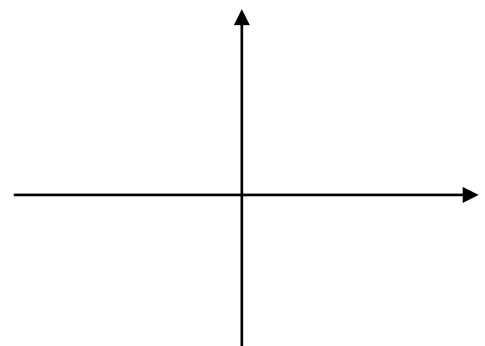
Degree	Basic Shape: $y = x^n$	Positive Leading Coefficient	Negative Leading Coefficient	Number of x -intercepts	Number of Turning Points
2					
3					
4					

SKETCHING POLYNOMIALS | EXAMPLE PROBLEM PAIR

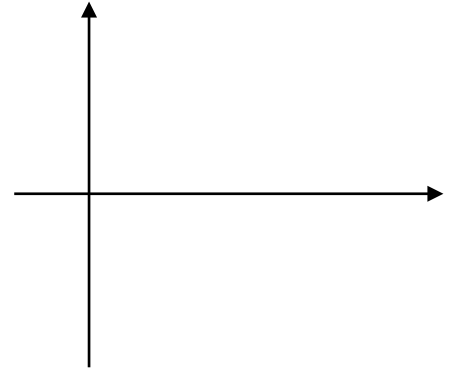
1E. Sketch the graph of $y = -2x(x - 1)(x - 4)$



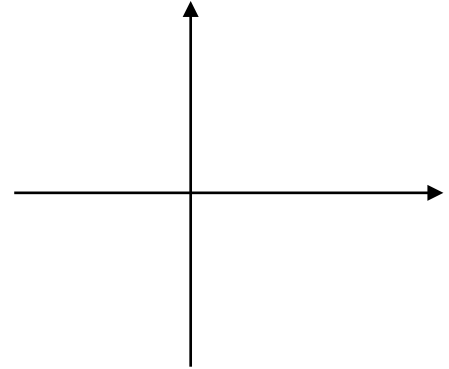
1P. Sketch the graph of $y = (x + 3)(x + 2)(x - 4)(x - 1)$



2E. Sketch the graph of $y = (2 - x)(x - 3)^2$



2E. Sketch the graph of $y = (x - 2)^2(2x + 1)$

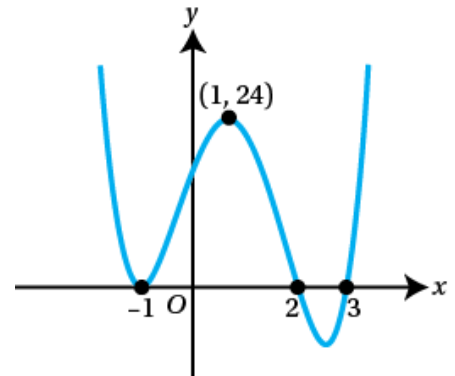


FINDING AN EQUATION FROM THE GRAPH | KEY POINTS

- Use the shape of the curve and position of the x -intercepts to write down the factors of the polynomial.
- Use any other point on the curve to find the constant factor.

FINDING AN EQUATION FROM THE GRAPH | EXAMPLE PROBLEM PAIR

3E. Find the equation of the quartic graph shown.



3E. Find the equation of the cubic graph shown.

