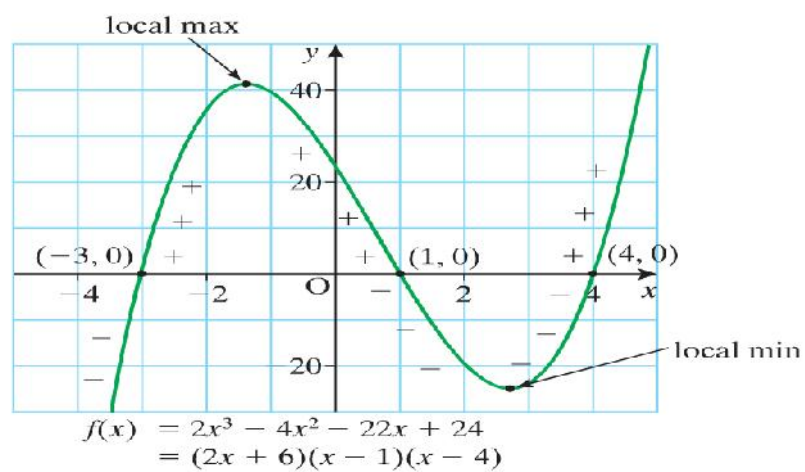
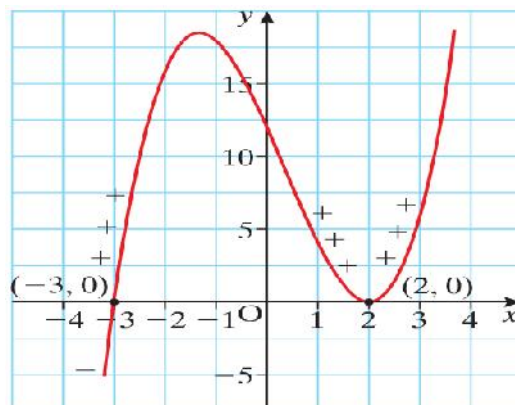


Graphs of cubic polynomials

Three real roots

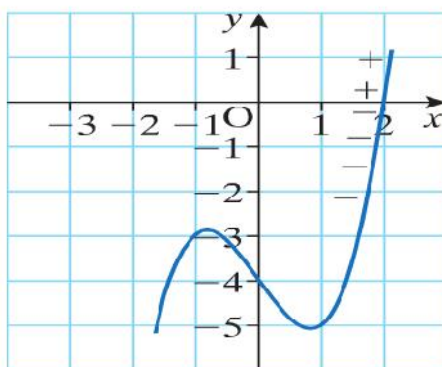


Three real roots, two of which repeat



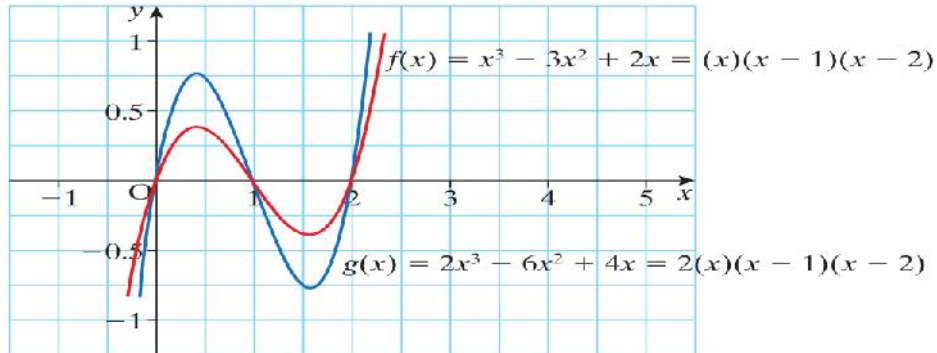
$$\begin{aligned} f(x) &= x^3 - x^2 - 8x + 12 \\ &= (x + 3)(x - 2)(x - 2) \\ &= (x + 3)(x - 2)^2 \end{aligned}$$

One real, two imaginary roots

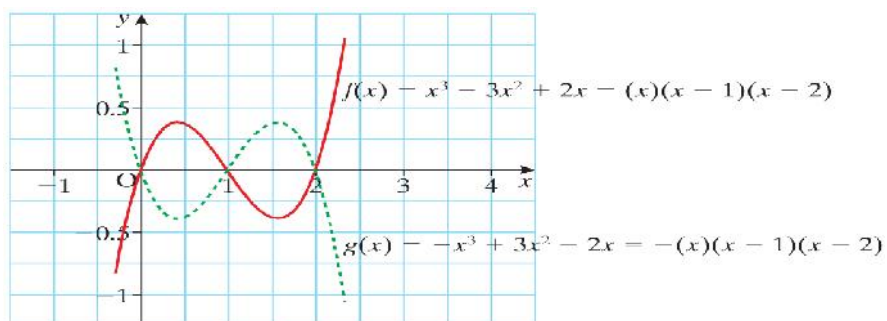


$$\begin{aligned} f(x) &= x^3 - 2x - 4 \\ &= (x - 2)(x^2 + 2x + 2) \end{aligned}$$

**4. Comparing $f(x) = x^3 - 3x^2 + 2x$
and $g(x) = 2x^3 - 6x^2 + 4x = 2f(x)$**



**5. Comparing $f(x) = x^3 - 3x^2 + 2x$
and $g(x) = -x^3 + 3x^2 - 2x = -f(x)$**



6. The graphs of $f(x) = ax^3$ 