# POLYNOMIAL FUNCTIONS

**1** Sketch the graph of each function

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|---|---|
| $f(x) = x(x-2)(x+3)$ | $f(x) = 2(x-\frac{1}{2})(x+1)(2x+3)$ |

**4** **(a)** Find the linear factors of $x^3 - 5x^2 + 8x - 4$.

**(b)** Find the values of $x$ for which: **(i)** $x^3 - 5x^2 + 8x - 4 = 0$ **(ii)** $x^3 - 5x^2 + 8x - 4 > 0$

**(c)** Sketch the graph of $f$ where $f(x) = x^3 - 5x^2 + 8x - 4$.

**8** Show that the graph of $f$, where $f(x) = x^3 - 8$, cuts the $x$-axis at one point only.

**9** Show that the graph of $f$, where $f(x) = x^3 - x^2 - 8x + 12$, cuts the $x$-axis at one point and touches it at another. Find the values of $x$ at these points.

**10** Sketch graphs of each function. For what values of $x$ is each function positive?

| | | |
|---|---|---|
| **(a)** $y=(x-1)(x+2)(x-3)$ | **(c)** $y=x(x^2-1)(x+2)$ | **(d)** $y=x^2(x-2)^2$ |