4. Given that

- $f(x) = 2x^3 + 3x^2 - 16x + 16$
- $f(-4) = 0$

(a) write $f(x)$ in the form

$$(x + a)\,Q(x)$$

where a is a constant and $Q(x)$ is a quadratic expression.

(3)

(b) Hence prove that -4 is the only real root of the equation

$$f(x) = 0$$

(*Solutions relying on calculator technology are not acceptable*.)

(2)