

4 The cubic polynomial $2x^3 - kx^2 + 4x + k$, where k is a constant, is denoted by $f(x)$. It is given that $f'(2) = 16$.

(a) Show that $k = 3$. **[4]**

For the remainder of the question, you should use this value of k .

(b) Use the factor theorem to show that $(2x + 1)$ is a factor of $f(x)$. **[2]**

(c) Hence show that the equation $f(x) = 0$ has only **one** real root. **[4]**