6 A curve has equation $f(x) = x^3 - 16x$.

(a) (i) Find $\int_0^k f(x)\,dx$, where k is a positive constant, giving your answer in terms of k. **[3]**

(ii) Show that $\int_{-k}^{k} f(x)dx = 0$. **[1]**

(b) Use the result from part **(a)(ii)** to explain what can be deduced about the curve $y = f(x)$. **[1]**

(c) Find the total area enclosed by the curve $y = f(x)$ and the x-axis. **[3]**