2. $$f(x) = x^3 - 5x^2 + \frac{3}{x} - 4 \qquad x > 0$$

(a) Find $f'(x)$.

(2)

Given that $f(0.5) = 0.875$ and $f(0.6) = -0.584$

(b) explain why the equation $f(x) = 0$ has a root in the interval $[0.5, 0.6]$

(1)

Given that this root is α and using 0.5 as a first approximation to α

(c) apply the Newton-Raphson method once to $f(x)$ to find a second approximation to α. Give your answer to 3 decimal places.

(2)