

1. Compute the following integrals

(a)  $\int \frac{x^3 - 4x + 7}{x^2 + 2x - 3} dx$

(b)  $\int \frac{\ln x}{x} dx.$

2. A spring has natural length 30cm. It requires 2J of work to stretch it from 40 cm to 45 cm. How far beyond its natural length will a force of 64 N keep the spring stretched? *Remember Newtons are measured in **meters**.*

3. Is  $\int_{-\infty}^{\infty} \frac{x}{\sqrt{2} + x^4} dx$  convergent or divergent? If it converges compute its value.