Principles of Data Science Coursework Report

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1 Section A

1.1 Part (a)

We begin by showing that both densities s and b are properly normalised in the range $M \in [-\infty, +\infty]$. In the former case, as a first step we use a change of variables $Z = \mu + \sigma M$ such that $\frac{dM}{dZ} = \sigma$, for which the integral limits don't change:

$$\int s(M; \mu, \sigma) = \int \frac{1}{\sqrt{2\pi}\sigma} \exp\left[-\frac{(M-\mu)^2}{2\sigma^2}\right] dM$$

1.2 Part (b)

2 Section B