

$$f(m) = \int_a^b \left(\mu - \frac{a+b}{2} \right)^2 \left(\frac{1-\varepsilon}{b-a} \mu + \frac{b\varepsilon-a}{b-a} \right) e^{-\frac{(a-m)^2}{2\sigma^2}} d\mu.$$