

1. Show that:

(a) $\ln\left(\frac{a}{b}\right) = \ln(a) - \ln(b)$

(b) $\ln(a^q) = q \ln(a)$ where $q \in \mathbb{Q}$.

(c) $\lim_{x \rightarrow 0^+} \ln(x) = -\infty$