

MATH20802: STATISTICAL METHODS
SEMESTER 2
PROBLEM SHEET 1

Show that the mgf $E[\exp(tX)]$, $t > 0$ does not exist if X has the following pdfs

1. the Pareto distribution with $f(x) = 3x^{-4}$, $x > 1$.
2. the inverse gamma distribution with $f(x) = x^{-3} \exp(-x^{-1})$, $x > 0$.
3. the Lomax distribution with $f(x) = 2(1+x)^{-3}$, $x > 0$.
4. the log-normal distribution with $f(x) = \left(\sqrt{2\pi}x\right)^{-1} \exp[-(\log x)^2/2]$, $x > 0$.
5. the Fréchet distribution with $f(x) = x^{-2} \exp(-x^{-1})$, $x > 0$.