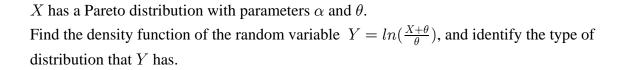
EXAM M QUESTIONS OF THE WEEK

S. Broverman, 2005

Question 10 - Week of September 26



The solution can be found below.

Question 10 Solution

$$f_X(x) = rac{lpha heta^lpha}{(x+ heta)^{lpha+1}} \ ext{for} \ x>0 \ .$$

$$Y = ln(\frac{X+\theta}{\theta}) = g(X)$$

$$\to X = \theta(e^Y - 1) = k(Y).$$

$$f_Y(y) = f_X(k(y)) \cdot k'(y) = \frac{\alpha \theta^{\alpha}}{(k(y) + \theta)^{\alpha + 1}} \cdot \theta e^Y = \frac{\alpha \theta^{\alpha}}{(\theta e^y)^{\alpha + 1}} \cdot \theta e^Y = \alpha e^{-\alpha y}$$
.

This is the pdf of the exponential distribution with mean $\frac{1}{\alpha}$.