

**MATH4/68181: Extreme values and financial risk**  
**Semester 1**  
**Problem sheet for Week 11**

1) For the standard generalized extreme value (GEV) distribution given by the cdf

$$F(x) = \exp \left\{ -(1 + \xi x)^{-1/\xi} \right\}$$

(where  $1 + \xi x > 0$ ), derive the following:

- (a) the pdf,
- (b) the  $n$ th moment,
- (c) the mean,
- (d) the variance.

2) For the standard generalized Pareto (GP) distribution given by the cdf

$$F(x) = 1 - (1 + \xi x)^{-1/\xi}$$

(where  $x \geq 0$  if  $\xi \geq 0$  and  $0 < x < -1/\xi$  if  $\xi < 0$ ), derive the following:

- (a) the pdf,
- (b) the  $n$ th moment,
- (c) the mean,
- (d) the variance.