

**Introduction to Probability**  
**Quiz 6**

The joint probability density function of  $X$  and  $Y$  is given by

$$f(x, y) = \frac{1}{8}(y^2 - x^2)e^{-y} \quad -y \leq x \leq y, \quad 0 < y < \infty.$$

1. Find the marginal density of  $X$ ;

2. Find the marginal density of  $Y$ .