1. Suppose that $X$ and $Y$ are two independent normal random variables with the same mean, $\mu$, and the same variance, $\sigma^2$. Is the distribution of $W = X + Y$ the same as the distribution of $V = 2X$? Explain.

2. When a current $I$ (measured in amperes) flows through a resistance $R$ (measured in ohms), the power generated is given by $W = I^2R$ (measured in watts). Suppose that $I$ and $R$ are independent random variables with densities

$$f_I(x) = 6x(1-x) \quad \text{for} \quad 0 \leq x \leq 1$$
$$f_R(x) = 2x \quad \text{for} \quad 0 \leq x \leq 1.$$ 

Determine the density function of $W$. 