## Polar Coordinates and Random Variables Tutorial Exercise

Given two random variables $X, Y$ having the following joint probability density function:

$$
f(x, y)=\frac{1}{2 \pi \sigma^{2}} e^{-\frac{\left(x^{2}+y^{2}\right)}{2 \sigma^{2}}}
$$

calculate the probability $\mathrm{X}^{2}+\mathrm{Y}^{2} \leq a^{2}$.

