1. An input signal $X$ has the following probability density

$$p(x) = \frac{1}{2\lambda} e^{-\frac{|x|}{\lambda}}$$

An output signal $Y = |X|$.

(a) Determine $h(X)$
(b) Determine $h(Y)$
(c) Show that $h(Y|X) = 0$
(d) Determine $h(X|Y)$. Can you give an explanation of the values found?

2. For the continuous joint Gaussian random variable $X$ and $Y$, it is given that:

$$E(X) = E(Y) = 0$$
$$Var(X) = \sigma^2$$
$$Var(Y) = \sigma^2$$
$$\rho(X,Y) = \rho$$

(a) Determine $h(Y)$
(b) Determine $h(X|Y)$
(c) Determine $h(X,Y)$
(d) How are these quantities influenced if $\rho = 0$ and how do you explain this?

3. Problem 9.5

4. Problem 9.7