* Assignment 1.

1. Let X and Y be random variables such that $E(X)=5$, $Var(X)=1$, $E(Y)=3$, $Var(Y)=4$ and $Corr(X,Y)=0.5$. Find:

(a) $Cov(X,Y)$.

$$Corr(X,Y) = \frac{Cov(X,Y)}{\sigma_X \sigma_Y} = \frac{Cov(X,Y)}{\sqrt{1}\times\sqrt{4}} = \frac{Cov(X,Y)}{2} = \frac{1}{2}$$

$$Cov(X,Y) = 1.$$

(b). $Cov(2X+Y,\ X-7Y+1)$.

$$= 2Cov(X,X) - 14Cov(X,Y) + Cov(X,Y) - 7Cov(Y,Y)$$

$$= 2Var(X) - 13Cov(X,Y) - 7Var(Y)$$

$$= 2 - 13 - 28 = -39.$$