

EE381 Homework #6

- 1) A random variable X is defined by:

$$X = \begin{cases} -2 & \text{prob. } 1/3 \\ 3 & \text{prob. } 1/2 \\ 1 & \text{prob. } 1/6 \end{cases}$$

Find the first four moments about the mean.

- 2) The joint probability function for the random variables X and Y is given in the following table:

$X \backslash Y$	0	1	2
0	1/18	1/9	1/6
1	1/9	1/18	1/9
2	1/6	1/6	1/18

Find

- $\text{Var}(X)$ and $\text{Var}(Y)$
 - σ_X and σ_Y
 - σ_{XY}
 - ρ
- 3) Find (a) the covariance, (b) the correlation coefficient of two random variables X and Y if $E(X) = 2$, $E(Y) = 3$, $E(XY) = 10$, $E(X^2) = 9$, $E(Y^2) = 16$.
- 4) The correlation coefficient of two random variables X and Y is $-1/4$ while their variances are 3 and 5. Find the covariance.

Note: Your answers should show your step-by-step work. Answers which have only final results are not accepted.