**STAT 50 – Section 2.6 Quiz Please Show Work and Provide Answers on Separate Paper**

1. A production facility contains two machines that are used to rework items that are initially defective. Let be the number of hours that first machine is in use, and let be the number of hours that the second machine is in use, on a randomly chosen day. Assume that have the joint probability density function given by:

**You may use the following results: , to save some time.**

* 1. Find the marginal density of .
  2. Find .
  3. Are and independent? **Explain in terms of density functions.**
  4. Find , that is, the correlation between X and Y. Are and independent? **If possible, explain in terms of correlation.**
  5. Find ).

2. Quality-control checks on wood paneling involve counting the number of surface flaws on each panel. On a given 2 x 8 ft panel, let be the number of surface flaws due to uneven application of the final coat of finishing material, and let  be the number of surface flaws due to inclusion of foreign particles in the finish. The joint probability mass function  of  is presented in the following table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | 0 | 1 | 2 |  |
| 0 | 0.25 |  | 0.20 |  |
| 1 | 0.10 | 0.25 | .10 |  |
|  |  |  |  |  |

1. Find the marginal pmf’s for . **Make sure you label which is which.**
2. Are  independent? **Explain.**
3. Find .
4. Find the variance of .