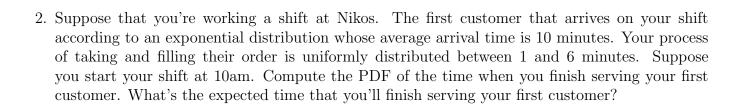
MATH 362—Work Sheet 24

Dr. Justin M. Curry

NOT DUE BUT RECOMMENDED FOR THE FINAL

	Name:
1.	Suppose (X,Y) have a JDF that is uniform on the triangle bounded above by the line $y=1-x$ and $y \ge 0$ and $x \ge 0$.
	(a) Suppose a point is sampled from this distribution and a rectangle is formed using the point and the origin. Compute the expected area.
	(b) Compute the covariance of X and Y .
	(c) Compute the probability that the rectangle from Part (a) has area less than 1/16.
	(c) compare the probability that the rectangle from rait (a) has area less than 1/10.



3. Suppose X has a uniform (0,1) distribution and $P(A \mid X=x)=x^2$. What is P(A)?

- 4. Suppose X,Y are RVs with JDF $f(x,y) = \lambda^3 x e^{-\lambda y}$ for 0 < x < y and 0 otherwise.
 - (a) Find the PDF of Y.

(b) Compute E(Y)

(c) (2 points) Compute $E(X \mid Y = 1)$.

- 5. (8 points) The RV X has a uniform distribution on (0,1). Given that X=x, the RV Y is binomial with parameters n=5 and p=x.
 - (a) Find E(Y) and $E(Y^2)$

(b) Find P(Y = y and x < X < x + dx)

(c) Find the density of X given Y = y. Do you recognize it? If yes, as what?