

Day 6

1. Evaluate the following

1) $\int_1^3 e^{-4x} dx$

2) $\int_1^3 7^x dx$

3) $\int x e^{2x} dx$

4) $\int x^{1/2} \ln x dx$

5) $\int_0^\infty \frac{1}{x} dx$

6) $\int_0^\infty \frac{x}{1+x^2} dx$

7) $\int_{-1}^1 \int_{x^3}^{x+1} (3x + 2y) dy dx$

8) $\int_1^2 \int_1^3 (x + y + xy) dx dy$

9) $R: x \geq 0, y \geq 0, z \geq 0, x + y + z \leq 1$

a) $\iiint_R 1 dx dy dz$

b) $\iiint_R xyz dx dy dz$

2. $f(y) = .2$ if $0 \leq y \leq 5$ and 0 otherwise. z is a function of y . Find $E(z(y))$ and $z(E(y))$ for

- a. $z = y$
- b. $z = y^2$
- c. $z = y^{1/2}$.

3. $f(y) = 1.5y^2 + y$ if $0 \leq y \leq 1$ and 0 otherwise. $w = 5 - .5y$. Find $E(y)$, $V(y)$, $E(w)$ and $V(w)$.

4. $f(x,y) = 4xy$ for $0 < x < 1$ and $0 < y < 1$ and 0 otherwise.

- a. Find the marginal density of for x and y .
- b. Find the conditional density for x given that $y = y_0$.