

Completion Points = 10
Selected Problem points = 10

HW 4 MATH 2850

Sec 15.1

$$7 \int_0^1 \int_0^1 \frac{y}{1+xy} dx dy = \int_0^1 \ln|1+xy| \Big|_0^1 dy$$

$$= \int_0^1 \ln|1+y| dy$$

$$u = \ln|1+y| \quad du = \frac{1}{1+y} dy$$

$$dv = dy \quad v = y$$

$$= y \ln|1+y| \Big|_0^1 - \int_0^1 \frac{y}{1+y} dy$$

$$= \ln 2 - \int_0^1 \frac{(1+y) - 1}{1+y} dy$$

$$= \ln 2 - \int_0^1 dy + \int_0^1 \frac{dy}{1+y}$$

$$= \ln 2 - y \Big|_0^1 + \ln|1+y| \Big|_0^1$$

$$= \ln 2 - 1 + \ln 2$$

$$= \boxed{2 \ln 2 - 1}$$

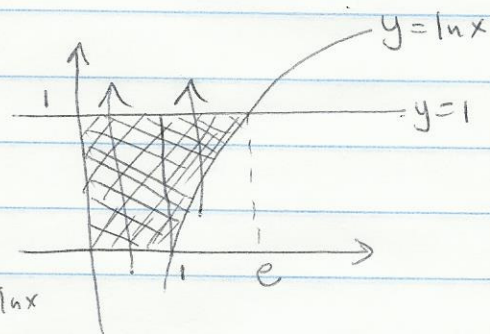
$$25 \quad V = \iint_R f(x,y) dA = \int_0^1 \int_0^1 (2-x-y) dy dx = \int_0^1 (2y - xy - \frac{1}{2}y^2) \Big|_0^1 dx$$

$$= \int_0^1 (\frac{3}{2} - x) dx$$

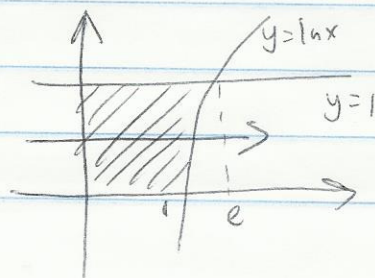
$$= \frac{3}{2}x - \frac{x^2}{2} \Big|_0^1 = \boxed{1}$$

Sec 15.2

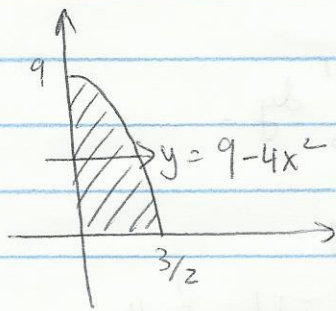
$$16(a) \int_0^1 \int_0^1 dy dx + \int_1^e \int_{\ln x}^1 dy dx$$



$$(b) \int_0^1 \int_0^{e^y} dx dy$$



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$$4x^2 = 9 - y$$

$$x = \frac{1}{2}\sqrt{9-y}$$

$$0 \leq x \leq \frac{1}{2}\sqrt{9-y}$$

$$0 \leq y \leq 9$$

$$\int_0^9 \int_0^{\frac{1}{2}\sqrt{9-y}} 16x \, dx \, dy$$

15.4 23 $\int_0^{\pi/2} \int_0^1 r^3 \sin\theta \cos\theta \, dr \, d\theta = \int_0^{\pi/2} \int_0^1 (r \sin\theta)(r \cos\theta) r \, dr \, d\theta$

$$0 \leq r \leq 1, \quad 0 \leq \theta \leq \frac{\pi}{2}$$

$$\int_0^1 \int_0^{\sqrt{1-x^2}} xy \, dy \, dx \quad \text{or} \quad \int_0^1 \int_0^{\sqrt{1-y^2}} xy \, dx \, dy$$

