MATH 232 NAME:
15.3

Partial solutions for 1-4 5-11(odds) 19 29 31

1. $\int_0^{2\pi}\int_2^5 f(r\cos(\theta), r\sin(\theta))r\ dr\ d\theta$

2. $\int_{-1}^1\int_{-x}^1 f(x,y)\ dy\ dx$

3. $\int_\pi^{2\pi}\int_0^1 f(r\cos\theta, r\sin\theta)\ r\ dr\ d\theta$

4. $\int_{-\pi/4}^{3\pi/4}\int_0^3 f(r\cos\theta, r\sin\theta)\ r\ dr\ d\theta$

5. $\int_{\pi/4}^{3\pi/4}\int_1^2 r\ dr\ d\theta = 3\pi/4$

7. $\int\int_D x^2y\ dA = \int_0^\pi\int_0^5 r^4\cos^2\theta\sin\theta\ dr\ d\theta = 1250/3$

9. $\int_0^{\pi/2}\int_1^3 \sin(r^2)r\ dr\ d\theta = \frac{\pi}{4}(\cos 1 - \cos 9)$

11. $\int_{-\pi/2}^{\pi/2}\int_0^2 e^{-r^2}r\ dr\ d\theta = \frac{\pi}{2}(1-e^{-4})$

29. $\int_0^{\pi/2}\int_0^2 e^{-r^2}r\ dr\ d\theta = \frac{\pi}{4}(1-e^{-4})$

31. $\int_0^{1/2}\int_{\sqrt{3}y}^{\sqrt{1-y^2}} xy^2\ dx\ dy = \int_0^{\pi/6}\sin^2\theta\cos\theta\ d\theta \cdot \int_0^1 r^4\ dr = 1/120$

2. $\int_{-1}^1\int_{-x}^1 f(x,y)\ dy\ dx$

4. $\int_{-\pi/4}^{3\pi/4}\int_0^3 f(r\cos\theta, r\sin\theta)r\ dr\ d\theta$

6. $\pi/2$

8. $16/3 - 4\sqrt{2}$

10. $\frac{\pi}{2}(b^2-a^2)$

12. $2\pi(2\sin 2 + \cos 2 - 1)$

17. $\pi/3 + \sqrt{3}/2$

30. $\int_0^\pi\int_0^a (2r\cos\theta + r\sin\theta)r\ dr\ d\theta$