April 6, 2007
Answer Question Section 9.4

Problem #7

$$\int \frac{\sin x}{2+\cos x}\,dx$$

$$u = 2+\cos x$$

$$du = -\sin x\,dx$$

$$-du = \sin x\,dx$$

$$\int \frac{\sin x}{2+\cos x}\,dx = \int -\frac{1}{u}\,du = -\ln|u| + C = -\ln|2+\cos x| + C$$

Problem #11

$$\int x\cos x\,dx$$

$$u = x \qquad dv = \cos x\,dx$$

$$du = dx \qquad v = \sin x$$

$$\int x\cos x\,dx = x\sin x - \int \sin x\,dx = x\sin x - (-\cos x) + C = x\sin x + \cos x + C$$

Problem #15

$$\int_0^{\pi/3} \sin x\,dx = \left[-\cos x\right]_0^{\pi/3} = \left[-\cos\frac{\pi}{3}\right] - \left[-\cos 0\right] = -\frac{1}{2} + 1 = \frac{1}{2}$$

Section 8.5

Approximation for the change in z as x moves from a to a + dx and y moves from b to b + dy is $dz = f_x(a, b)\,dx + f_y(a, b)\,dy$