$\int_{x=0}^{x=\pi/2} \sin^3 x \cos x\,dx$

We can also use use u-substitution with definite integrals, rewriting everything in terms of u, including the limits of the integral.

$\int_0^{\pi/2} \sin^3 x \cos x\,dx =$

$u = \sin x \qquad du = \cos x\,dx$

$x = 0 \quad u = 0 \quad x = \pi/2 \quad u = 1$

$\int_{u=0}^{u=1} u^3\,du = \left.\frac{u^4}{4}\right]_0^1$

$= \frac{1}{4} - 0$

$= \frac{1}{4}$

Try this one:

$$\int_0^{\sqrt{\pi/2}} 2x\cos\left(x^2\right)dx$$

$\int_0^{\sqrt{\pi/2}} 2x\cos(x^2)\,dx =$

$u = x^2 \qquad du = 2x\,dx$

$x = 0 \quad u = 0^2 = 0 \qquad x = \sqrt{\frac{\pi}{2}} \quad u = \frac{\pi}{2}$

$\int_0^{\pi/2} \cos u\,du = \sin u\Big]_0^{\pi/2}$

$= \sin\frac{\pi}{2} - \sin 0$

$= 1 - 0$

$= 1$

Page 411 #11-14, 29 -47 (odd) [skip 31 and 41]

Correction to answer key, in problem #43 the exponent should be -3

HW: Watch the video on integration by parts (at least the first 10 minutes), [link at website] take notes and show them to me