

Name: \_\_\_\_\_

QUIZ 9  
October 30, 2001

Compute the following indefinite integrals. *Simplify your answers so that there are no fractional or negative exponents.*

(a)  $\int 4x^3\sqrt{x^4 + 6}dx$

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

## Solutions to Quiz 9

(a) Let  $u = x^4 + 6$ ; so  $du = 4x^3 dx$ . Then

$$\int 4x^3 \sqrt{x^4 + 6} dx = \int u^{1/2} du = (2/3)u^{3/2} = (2/3)\sqrt{u^3}.$$

Now substitute back in for  $u$  to get

$$\int 4x^3 \sqrt{x^4 + 6} dx = (2/3)\sqrt{(x^4 + 6)^3}.$$

(b) Set  $u = -3x$ ; so  $du = -3dx$ , and  $2dx = (-2/3)du$ . Then

$$\int \frac{2}{e^{3x}} dx = -\frac{2}{3} \int e^u du = -(2/3)e^u.$$

Substitute back for  $u$  to get

$$\int \frac{2}{e^{3x}} dx = -(2/3)e^{-3u} = \frac{-2}{3e^{3u}}.$$