

Calculus Study Guide: section 5.7

Evaluate the integrals.

$$\int_0^{\frac{\sqrt{3}}{2}} \frac{dx}{\sqrt{1-x^2}} = \sin^{-1} x \Big|_0^{\frac{\sqrt{3}}{2}} = \sin^{-1} \frac{\sqrt{3}}{2} - \sin^{-1} 0$$

$$= \frac{\pi}{3} - 0 = \frac{\pi}{3}$$

answer: \_\_\_\_\_

$$\int_0^1 3^{2x+1} dx = \frac{\frac{1}{2} \cdot 3^{2x+1}}{\ln 3} \Big|_0^1 = \frac{1}{2 \ln 3} (3^3 - 3^1) = \frac{24}{2 \ln 3}$$

$$= \frac{12}{\ln 3}$$

answer: \_\_\_\_\_

$$\int_1^2 4^{x^2+3x} (2x+3) dx$$

$u = x^2 + 3x$   
 $du = 2x + 3 dx$

$u = 1^2 + 3 = 4$   
 $u = 2^2 + 6 = 10$

$$\int 4^u du$$

$$\frac{4^u}{\ln 4} \Big|_4^{10} = \frac{4^{10} - 4^4}{\ln 4} = \frac{1,048,576 - 256}{\ln 4}$$

answer: \_\_\_\_\_