

$$4 \frac{d}{dx} \int \sin x \sqrt{t^3 + 2t + 1} dt = (\sin^3 x + 2 \sin x + 1)^{1/2} \cos x + (\cos^3 x + 2 \cos x + 1)^{1/2} \sin x$$

$$5 \int_0^1 e^{kx} dx \quad u = kx \quad du = k dx$$

$$\int_0^k \frac{e^u}{k} du = \frac{e^u}{k} \Big|_0^k = \frac{e^k - 1}{k}$$

6. [12] Find $\int_0^{3/2} \sqrt{2t+1} dt$.

$$u = 2t+1 \quad du = 2 dt \quad dt = \frac{du}{2}$$

$$\int_0^{3/2} \sqrt{2t+1} dt = \int_{u(0)}^{u(3/2)} u^{1/2} \frac{du}{2} = \int_0^3 u^{1/2} \frac{du}{2}$$

$$= \frac{1}{2} \frac{u^{3/2}}{3/2} \Big|_0^3 = \frac{1}{3} 3^{3/2}$$