Business Calculus, Spring 2004

Quiz #11

Name: _____
Section Time:_____
TA's Name: _____

1. Find the antiderivative of
$$f(x) = x^2 + \frac{4}{3}x^{1/3} - 3.$$

2. Evaluate
$$\int \left(\frac{1}{\sqrt{x}} + e^{x/2}\right) dx.$$

Solutions:

1. Here the only rule we need to know is that the antiderivative of x^n is $\frac{1}{n+1}x^{n+1}$. Therefore for this problem an antiderivative is
$$\begin{aligned} F(x) &= \frac{1}{3}x^3 + \frac{4}{3}\frac{1}{\frac{4}{3}}x^{4/3} - 3x + C \\ &= \frac{1}{3}x^3 + x^{4/3} + 3x + C \end{aligned}$$

2. The only extra rule we need here is that $\int e^{kx}dx = \frac{1}{k}e^{kx}$. Therefore
$$\begin{aligned} \int \left(\frac{1}{\sqrt{x}} + e^{x/2}\right) dx &= \int x^{-1/2} + e^{x/2}dx \\ &= \int x^{-1/2}dx + \int e^{x/2}dx \\ &= \frac{1}{\frac{1}{2}}x^{1/2} + \frac{1}{\frac{1}{2}}e^{x/2} + C \\ &= 2x^{1/2} + 2e^{x/2} + C \end{aligned}$$