Name: ______________________ Math 211 Quiz 10

Section: 302 ☐ 303 ☐ Apr 18, 2012

1. Find the indicated integral.

a. $\int 1dx$ **b.** $\int \frac{1}{x^2}dx$ **c.** $\int \sqrt{x}dx$ **d.** $\int \frac{2}{\sqrt{x}}dx$ **e.** $\int e^{2x}dx$ **f.** $\int \frac{2}{x}dx$

a. $x+C$

b. $-\frac{1}{x}+C$

c. $\frac{2}{3}x^{3/2}+C$

d. $4\sqrt{x}+C$

e. $\frac{1}{2}e^{2x}+C$

f. $2\ln|x|+C$

2. Find the indicated integral.

a. $\int \frac{x^2+2x+1}{x^2}dx$ **b.** $\int \sqrt{t}(t^2-1)dt$ **c.** $\int (e^t+1)^2dt$ **d.** $\int \ln(e^{-x^2})dx$

a. $\int 1+\frac{2}{x}+\frac{1}{x^2}dx = x+2\ln|x|-\frac{1}{x}+C$

b. $\int t^{5/2}-t^{1/2}\,dt = \frac{2}{7}t^{7/2}-\frac{2}{3}t^{3/2}+C$

c. $\int e^{2t}+2e^{t}+1\,dt = \frac{1}{2}e^{2t}+2e^{t}+x+C$

d. $\int -x^2\ln e\,dx = \int -x^2\,dx = -\frac{x^3}{3}+C$

3. Solve the given initial value problem for $y = f(x)$.

$$\frac{dy}{dx} = \frac{2}{x} - \frac{1}{x^2}, y(-1) = 1$$

$$y(x) = \int \frac{2}{x} - \frac{1}{x^2} \, dx = 2 \ln|x| + \frac{1}{x} + C$$

$$1 = y(-1) = 2 \ln 1 + \frac{1}{-1} + C = 0 - 1 + C = C - 1$$

$$1 = C - 1 \Rightarrow C = 2 \Rightarrow y(x) = 2 \ln|x| + \frac{1}{x} + 2$$