Mathematics 122

Name: _____ Key _____

You must show your work to get full credit.

1. Compute the following antiderivatives (don't forget the $+C$).

(a) $\int e^t \, dt = e^t + C$ $\underline{\quad e^t + C \quad}$

(b) $\int e^{3t} \, dt = \frac{e^{3t}}{3} + C$ $\underline{\quad \frac{e^{3t}}{3} + C \quad}$

(c) $\int \frac{4 \, dr}{r} = 4\ln(r) + C$ $\underline{\quad 4\ln(r) + C \quad}$

2. Compute $\int_1^a (6x^2 - 4x) \, dx$ $\underline{\quad 2a^3 - 2a^2 \quad}$

$$= \left(\frac{6x^3}{3} - \frac{4x^2}{2} \right) \Big|_1^a$$

$$= (2x^3 - 2x^2) \Big|_1^a$$

$$= (2a^3 - 2a^2) - (2(1)^3 - 2(1)^2)$$

$$= 2a^3 - 2a^2 - 0$$

Quiz #35   Name: _____Key_____

You must show your work to get full credit.

1. Compute the following antiderivatives (don't forget the $+c$).

(a) $\int \left(6x^3 + 12x^2 + 4x^2\right) dx$ $\frac{3}{2}x^4 + \frac{16x^3}{3} + c$

$= \frac{6x^4}{4} + \frac{12x^3}{3} + \frac{4x^3}{3} + c$

$= \frac{3}{2}x^4 + \frac{16x^3}{3} + c$

(b) $\int \left(6\sqrt{u} - \frac{4}{u^3}\right) du = \int (6u^{\frac{1}{2}} - 4u^{-3}) du = 4u^{\frac{3}{2}} + \frac{2}{u^2} + c$

$= 6\left(\frac{2}{3}\right)u^{\frac{3}{2}} - \frac{4u^{-2}}{(-2)} + c$

$= 4u^{3/2} + \frac{2}{u^2} + c$

2. Find the antiderivitive, $F(x)$, of $f(x) = 6x^2 - 12x$ with $F(1) = 10$.

$F(x) = \int (6x^2 - 12x) dx$ $F(x) = 2x^3 - 6x^2 + c$

$= \frac{6x^3}{3} - \frac{12x^2}{2} + c$

$= 2x^3 - 6x^2 + c$

To find c use

$F(1) = 2(1)^3 - 6(1)^2 + c = 10$

$2 - 6 + c = 10$

$c - 4 = 10$

$c = 14$