

Math 1700 Summer 2013

Quiz 1

Tuesday June 4 2013

No Work = No Credit

Name: _____ Student Number: _____

1. (5 points) Evaluate the indefinite integral $\int (x^2 + 1)(x^3 + 3x)^4 dx$.

Solution:

Try a substitution $u = x^3 + 3x$. Then $\frac{du}{dx} = 3x^2 + 3$, and $dx = \frac{du}{3x^2+3}$. We get:

$$= \int (x^2 + 1)(u)^4 \frac{du}{3x^2+3}$$

$$= \int (u)^4 \frac{du}{3}$$

$$= \frac{1}{3} \int (u)^4 du$$

$$= \frac{1}{3} \frac{u^5}{5}$$

$$= \frac{(x^3+3x)^5}{15} + C$$

2. (5 points) Evaluate the definite integral $\int_0^1 \cos(\frac{\pi t}{2}) dt$.

Solution:

Try a substitution $u = \frac{\pi t}{2}$. Then $\frac{du}{dt} = \frac{\pi}{2}$, and $dt = \frac{2du}{\pi}$. We get:

$$= \int_{t=0}^{t=1} \cos(u) \frac{2du}{\pi}$$

$$= \frac{2}{\pi} \int_{t=0}^{t=1} \cos(u) du$$

$$= \frac{2}{\pi} [\sin(u)]_{t=0}^{t=1}$$

$$= \frac{2}{\pi} [\sin(\frac{\pi t}{2})]_{t=0}^{t=1}$$

$$= \frac{2}{\pi} [\{\sin(\frac{\pi}{2})\} - \{\sin(0)\}]$$

$$= \frac{2}{\pi} [1 - 0]$$

$$= \frac{2}{\pi}$$

...show all work...show all work...show all work...show all work...show all work...