Name: _____ Class: _____ Date: _____ ID: A

Quiz#2

___ 1. Evaluate the indefinite integral.

$\int \cos^6 x \sin x \, dx$ $= -\int u^6 \, du$

$u = \cos x$

$du = -\sin x \, dx$

$= -\frac{u^7}{7} + C$

$= -\frac{1}{7}\cos^7 x + C$

___ 2. Evaluate the indefinite integral.

$\int \frac{e^x}{e^x + 5} \, dx$

$u = e^x + 5$

$du = e^x \, dx$

$= \int \frac{1}{u} \, du$

$= \ln|u| + C$

$= \ln|e^x + 5| + C$

3) Evaluate the definite integral.

$$\int_{-1}^{1} \frac{\sin x}{2+x^2}\,dx$$

$f(x) = \dfrac{\sin x}{2+x^2}$

$f(-x) = \dfrac{\sin(-x)}{2+(-x)^2} = \dfrac{-\sin x}{2+x^2}$ $\Rightarrow$ $f(x) = -f(x)$

$f(x)$ is an odd function

$$\int_{-1}^{1} \frac{\sin x}{2+x^2}\,dx = 0$$

4) Evaluate the definite integral.

$$\int_{e^{64}}^{e^{25}} \frac{dx}{x\sqrt{\ln x}}$$

$u = \ln x$

$du = \dfrac{1}{x}\,dx$

$$\rightarrow \int_{e^{64}}^{e^{25}} \frac{dx}{x\sqrt{\ln x}} = \int_{64}^{25} \frac{du}{\sqrt{u}} = \int_{64}^{25} u^{-1/2}\,du$$

since $u = \ln x$

$\ln e^{25} = 25$

$\ln e^{64} = 64$

$$= \left. \frac{u^{-1/2+1}}{-1/2+1} \right|_{64}^{25} = 2\left[\sqrt{25} - \sqrt{64}\right]$$

$$= 2[5-8]$$

$$= -6$$

5) Evaluate the indefinite integral.

$\int \sinh(1+4x)dx$

$u = 1+4x$

$du = 4\,dx$

$$= \frac{1}{4}\int \sinh(u)\,du$$

$$= \frac{1}{4}\cosh(u) + C$$

$$= \frac{1}{4}\cosh(1+4x) + C$$