Name: Key

Quiz No. 10
Sections 1202,1203
4/25/19

1. (10 pts.) Evaluate the integral using integration by parts.

$$\int \ln(2x+4)\,dx$$

$u = \ln(2x+4)$ $\quad du = \frac{2}{2x+4}\,dx$

$dv = 1\,dx$ $\quad v = x$

$$= x\ln(2x+4) - \int \frac{2x}{2x+4}\,dx$$

$$= x\ln(2x+4) - \int \frac{2x+4-4}{2x+4}\,dx$$

$$= x\ln(2x+4) - \int 1\,dx - \int \frac{-4}{2x+4}\,dx$$

$$\boxed{= x\ln(2x+4) - x + 4\ln|2x+4| + C}$$

2. (5 pts. extra credit [10 point maximum]) Evaluate the trigonometric integral.

$$\int \sec^6 x\,dx$$

$$= \int \sec^4 x \sec^2 x\,dx$$

$$= \int (1+\tan^2 x)^2 \sec^2 x\,dx$$

$u = \tan x$

$du = \sec^2 x\,dx$

$$= \int (1+u^2)^2\,du$$

$$= \int 1 + 2u^2 + u^4\,du$$

$$= u + \frac{2}{3}u^3 + \frac{1}{5}u^5 + C$$

$$= \tan x + \frac{2}{3}\tan^3 x + \frac{1}{5}\tan^5 x + C$$