MATH 1710: Tutorial 10 (Techniques of Integration)

1. Evaluate the following indefinite integrals:

   (i) $\int xe^{-x^2}\,dx$, (ii) $\int \frac{x^2}{(1+x^3)^3}\,dx$, (iii) $\int \frac{e^x}{1+e^{2x}}\,dx$, (iv) $\int \tan(3x)\,dx$

2. Find the length of the curve $y = ln(\cos x)$ from (0,0) to $(\pi/4,\ -ln(2)/2)$

3. Find the area of the region bounded by $y = \frac{x^2+1}{x+1}$, $x + 3y = 7$

4. Use integration by parts to evaluate the following integrals:

   (a) $\int x^2e^2x\,dx$, (b) $\int e^x\cos x\,dx$, (c) $\int ln(x^2{+}4)\,dx$, (d) $\int \frac{x}{\sqrt{2+x}}\,dx$

5. Evaluate the following trigonometric integrals:

   (i) $\int \frac{\tan^3 x\ \sec^2 x}{\sin^2 x}\,dx$, (ii) $\int \sqrt{\tan x}\ \sec^4 x\,dx$, (iii) $\int \frac{\tan^3 x}{\sec^4 x}\,dx$, (iv) $\int \sin^4 x\ \cos^2 x\,dx$