# MATH 1710 Tutorial 7

In problems 1–7, evaluate each of the indefinite integrals.

**1.** $\displaystyle\int \frac{x}{\sqrt{2x+3}}\,dx$

**2.** $\displaystyle\int \frac{x}{1-2x^{1/3}}\,dx$

**3.** $\displaystyle\int \sqrt{x}\ln 2x\,dx$

**4.** $\displaystyle\int x^2\sin 3x\,dx$

**5.** $\displaystyle\int \sec^3 2x\,dx$

**6.** $\displaystyle\int e^{2x}\cos 3x\,dx$

**7.** $\displaystyle\int \mathrm{Cos}^{-1}(2x)\,dx$

**8.** Evaluate the definite integral $\displaystyle\int_0^3 \frac{x^3}{\sqrt{9-x^2}}\,dx$ with:

(a) integration by parts,
(b) the substitution $u = 9 - x^2$,
(c) the substitution $u = \sqrt{9-x^2}$.

**Answers**

**1.** $\dfrac{1}{6}(2x+3)^{3/2} - \dfrac{3}{2}\sqrt{2x+3} + C$

**2.** $-\dfrac{1}{320}[15\ln|1-2x^{1/3}| + 96x^{5/3} + 60x^{4/3} + 40x + 30x^{2/3} + 30x^{1/3}] + C$

**3.** $\dfrac{2}{3}x^{3/2}\ln 2x - \dfrac{4}{9}x^{3/2} + C$

**4.** $-\dfrac{x^2}{3}\cos 3x + \dfrac{2x}{9}\sin 3x + \dfrac{2}{27}\cos 3x + C$

**5.** $\dfrac{1}{4}\sec 2x\tan 2x + \dfrac{1}{4}\ln|\sec 2x + \tan 2x| + C$

**6.** $\dfrac{e^{2x}}{13}(3\sin 3x + 2\cos 3x) + C$

**7.** $x\,\mathrm{Cos}^{-1}(2x) - \dfrac{1}{2}\sqrt{1-4x^2} + C$

**8.** 18