Dawson College: **Calculus II**: 201-NYB-05-S3: Fall 2010

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Quiz 5

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. §5.5 #50 *(5 marks)* Evaluate the definite integral:

$$\int_0^{1/2} \frac{\arcsin x}{\sqrt{1-x^2}}\,dx$$

$$= \int_0^{\pi/6} u\,du = \left[\frac{u^2}{2}\right]_0^{\pi/6}$$

$u = \arcsin x$

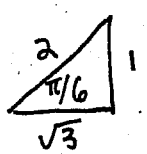
$du = \frac{1}{\sqrt{1-x^2}}\,dx$

$u(1/2) = \arcsin\left(\frac{1}{2}\right) = \frac{\pi}{6}$

$u(0) = \arcsin(0) = 0$

$$= \frac{(\pi/6)^2}{2} - \frac{0^2}{2}$$

$$= \frac{\pi^2}{72}$$



Question 2. §6.1 #15 *(5 marks)* Evaluate the definite integral:

$$\int_0^{\pi} t\sin 3t\,dt$$

$u = t \qquad du = dt$

$v = -\frac{\cos 3t}{3} \qquad dv = \sin 3t\,dt$

$$= \left[uv\right]_0^{\pi} - \int_0^{\pi} v\,du$$

$$= \left[t\left(-\frac{\cos 3t}{3}\right)\right]_0^{\pi} - \int_0^{\pi} -\frac{\cos 3t}{3}\,dt$$

$$= -\frac{\pi\cos 3\pi}{3} + \frac{1}{3}\int_0^{\pi} \cos 3t\,dt$$

$$= \frac{-\pi(-1)}{3} + \frac{1}{3}\left[\frac{\sin 3t}{3}\right]_0^{\pi}$$

$$= \frac{\pi}{3} + \frac{1}{3}\left[\frac{\sin 3\pi}{3} - \frac{\sin 3(0)}{3}\right]$$

$$= \frac{\pi}{3}$$