PRINT Your Name:____________________

Quiz 2 — August 28, 2009 – 8:00 section

Remove everything from your desk except this page and a pencil or pen.

$\boxed{\text{Circle}}$ your answer. **Show your work.**
The quiz is worth 5 points.

Compute $\int_0^1 \frac{y^2\,dy}{\sqrt{4-3y}}$.

Answer: We do a change of variables. Suppose that the expression under the radical was just a variable, then we could do algebraic tricks to finish the problem! We make it so! Let $u = 4-3y$. It follows that $du = -3dy$. Notice that when $x = 0$, then $u = 4$; and when $x = 1$, then $u = 1$. The original problem is equal to

$$\int_4^1 \frac{\left(\frac{4-u}{3}\right)^2 du}{-3\sqrt{u}} = \frac{1}{-27}\int_4^1 \frac{(4-u)^2 du}{\sqrt{u}}$$

$$= \frac{1}{-27}\int_4^1 \frac{(16-8u+u^2)du}{\sqrt{u}} = \frac{1}{-27}\int_4^1 (16u^{-1/2} - 8u^{1/2} + u^{3/2})du$$

$$= \frac{1}{-27}\left(16u^{1/2}2 - 8u^{3/2}\frac{2}{3} + u^{5/2}\frac{2}{5}\Big|_4^1\right) = \boxed{\frac{32 - \frac{16}{3} + \frac{2}{5} - (16\cdot 4 - \frac{8\cdot 8\cdot 2}{3} + \frac{64}{5})}{-27}}$$