Math 102 Calculus – Homework 1
Due on 14 July 2006 Friday, class time

The first question is 10 points, the others are 15 points.

Q-1 Evaluate the integral $\int_0^2 \int_x^2 2y^2 \sin(xy) \, dy \, dx$.

Q-2 Find the volume of the solid in the first octant bounded by the coordinate planes, the cylinder $x^2 + y^2 = 4$, and the plane $z + y = 3$.

Q-3 Evaluate the integral $\int_{-1}^1 \int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} \dfrac{2}{(1+x^2+y^2)^2} \, dy \, dx$.

Q-4 Find the volume of the wedge cut from the cylinder $x^2 + y^2 = 1$ by the planes $z = y$ and $z = 3y$.

Q-5 Evaluate the integral $\int_0^1 \int_0^1 \int_{x^2}^1 12xze^{zy^2} \, dy \, dx \, dz$.

Q-6 Find the volume of the cap cut from the sphere $x^2 + y^2 + z^2 = R^2$ by the plane $z = h$, where $0 \le h \le R$.

Q-7 Use the transformation $u = x - y$, $v = 2x + y$ to evaluate the integral $\displaystyle\int\int (2x^2 - xy - y^2) \, dx \, dy$ for the region R in the first quadrant bounded by the lines $y = -2x + 4$, $y = -2x + 7$, $y = x - 2$, and $y = x + 1$.

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