 Test 1, Math 1860 Section 021
Sept. 2013 Practice Name _____

There are five pages (two sided); the back page is for rough work. Point values of questions are indicated in the margins; 100 points are possible.

1. Evaluate the integral and simplify your answer.

   (a) $\displaystyle\int_{\ln 2}^{\ln 25} e^{-x/2}\,dx$ (6)

   (b) $\displaystyle\int_0^{\pi} \frac{\sin x\,dx}{2+\cos x}$ (8)

2. Evaluate the integral. (9)

   (a) $\displaystyle\int_1^e t^2 \ln t\,dt$ (9)

   (b) $\displaystyle\int x\cos 3x\,dx$ (10)

   (c) $\displaystyle\int (\sin 3\theta)^2\,d\theta$ (12)

   (d) $\displaystyle\int \frac{x^3}{\sqrt{4+x^2}}\,dx$

3. Set up an integral for the area of the *surface* generated by revolving the curve $y = \cos x$, $-\pi/2 \le x \le \pi/2$, about the x–axis. Simplify but do NOT evaluate the integral. (12)

4. Compute the volume of the solid generated by revolving the region bounded by the curves $y = (x-2)^2$ and $y = x$ about the y–axis. (Suggestion: Sketch R.) (17)

5. Find the volume of the solid that lies between planes perpendicular to the x–axis at $x = -1$ and $x = 1$. The cross-sections perpendicular to the x–axis are circular disks whose diameters run form the parabola $y = x^2$ to the parabola $y = 2 - x^2$. (17)