Math 129 - Section 017
Practice Problems for Test 1

1. Compute the following integrals. Simplify your answers as much as possible.

   a. $\int \frac{t^2}{1+t^2} dt$

   b. $\int x^n \cdot \ln(x^5) dx$

   c. $\int y e^{-y} dy$

   d. $\int z^2 (\arctan z) dz$

   e. $\int x \sin(x+1) dx$

   f. $\int_0^8 \frac{1}{(5x+2)^{(2/5)}}$

   g. $\int_3^\infty \frac{1}{\sqrt{v-1}} dv$

2. Find the value of a such that

$$\int_0^{\frac{\pi}{2}} (ax+1)\cos(x) dx = 7\pi.$$

3. Use the fact that

$$\int_0^\infty \frac{\sin t}{t} dt = \frac{\pi}{2}$$

   to compute

$$\int_0^\infty \frac{\sin\left(x^{\frac{3}{2}}\right)}{x} dx.$$

4. a. Find the largest value of c such that $g(x) = e^{-x^2}$ is concave down on $(-c, c)$.

   b. Use the All Sums program on your calculator to compute an approximation of $\int_{-c}^{c} e^{-x^2} dx$ that is accurate to 2 decimal places.

5. Let $f(x) = e^{-x^4}$ Rank the following in order from least to greatest: LEFT(n), RIGHT(n), MID(n), TRAP(n), $\int_0^{\frac{1}{2}} f(x) dx$.