Math 125 G - Winter 2008
Mid-Term Exam Number Two
February 28, 2008
Answers

1. (a) partial fractions:

$$\frac{5}{6}\ln|x+5| + \frac{1}{6}\ln|x-1| + C$$

(b) trig. substitution:

$$-\frac{1}{2}\ln\left|\frac{\sqrt{2}}{x} + \frac{\sqrt{2-x^2}}{x}\right| + C$$

2. (a) integration by parts:

$$\frac{1}{10}e^x(\cos 3x + 3\sin 3x) + C$$

(b)

$$\frac{1}{7}\tan^7 x + \frac{1}{5}\tan^5 x + C$$

3. (a) partial fractions:

$$\frac{1}{2}\log(|x+1|) + \frac{3}{2}\log(|x-1|) + x + C$$

(b) complete the square, then trig substitution:

$$\frac{x-3}{16\sqrt{-x^2+6x+7}} + C$$

4. (a) 2 (b) $\frac{2}{27}$

5. You need to work out the work required for each situation. You might begin by assuming a cone of height h with base radius r. If you orient both cases with the vertex at the origin, some expressions are simpler than they might otherwise be.

6. $p = \dfrac{-1+\sqrt{5}}{2}$