

## Math 241 - Section C1H - Homework 7

Assigned: 2/28/08

Due: 3/5/08 at the start of class.

Notation: Exercise a.b.c stands for Exercise c from Section a.b.

Problems to hand in:

- (1) 4.4.10.
- (2) 4.4.14.
- (3) 4.4.24.
- (4) Show that if  $x$ ,  $y$ , and  $z$  are positive real numbers, then

$$\frac{x + y + z}{3} \geq \sqrt[3]{xyz}.$$

[Hint: Let  $g(x, y, z) = \frac{x+y+z}{3}$  and  $f(x, y, z) = \sqrt[3]{xyz}$ . Fix some number  $k$  and minimize  $f(x, y, z)$  subject to  $g(x, y, z) = k$ ].

- (5) 4.6.8.
- (6) 4.6.13.
- (7) 4.6.22.
- (8) 4.6.30.
- (9) 5.2.4.
- (10) 5.2.15.
- (11) Find the length of the curve  $\vec{c}(t) = (t, t^2)$  for  $0 \leq t \leq 1/2$  by computing the path integral of  $f(x, y) = 1$  along this path.
- (12) 5.3.6.
- (13) 5.3.13.
- (14) 5.3.18.
- (15) Let  $\vec{F}(x, y) = -y\vec{i} + x\vec{j}$ . Compute the circulation of  $\vec{F}$  around the circle of radius  $h$  centered at  $(a, b)$  and compare the result with the curl of  $\vec{F}$ .