

Math 126 D - Spring 2011
Mid-Term Exam Number Two
May 17, 2011
Answers

1. There are three critical points: $(0,0)$, which is a local minimum, and $(\pm\sqrt{2}, -1)$ which are both saddle points.
2. The tangent plane is $z = (e + 1)x - 1$.
3. The optimum box should have a square base with sides of length $\frac{2}{\sqrt[3]{5}}$ meters, and height $\frac{5^{2/3}}{2}$ meters.
4. (a) $e^2 - e$ (b) $-\frac{1}{6} \cos 64 + \frac{1}{6}$

5.

$$\iint_D xy \, dA = \int_{\pi/4}^{\pi/2} \int_1^2 r^3 \cos \theta \sin \theta \, dr \, d\theta = \frac{15}{16}$$