Math 126 C - Autumn 2010
Mid-Term Exam Number Two
November 23, 2010
Answers

There were two versions of the exam.

Version A - In problem 1, $f(x,y) = \frac{9}{4}xy^2 + y^3 - x$.

1. There are two critical points: $(-4/9, 2/3)$ and $(4/9, -2/3)$ and they are both saddle points.
2. (a) $\dfrac{1}{2}e^4 - \dfrac{3}{2}e^3 - \dfrac{1}{2}e + \ln 2 - \dfrac{9}{8}$ (b) $\dfrac{1}{4}\sin 64$
3. 4π
4. $t = \frac{1}{2}\sin^{-1}\frac{2}{3.3} \approx 0.32554929$
5. (a) $z = 5x - 4y + 8$ (b) There are infinitely many such pairs. One pair is $(1, 1, 0)$ and $(5, 0, 5)$.

Version B - In problem 1, $f(x,y) = \frac{1}{4}xy^2 + y^3 - x$.

1. There are two critical points: $(-12, 2)$ and $(12, -2)$ and they are both saddle points.
2. (a) $\dfrac{1}{2}e^4 - \dfrac{3}{2}e^3 - \dfrac{1}{2}e + \ln 2 - \dfrac{9}{8}$ (b) $\frac{1}{6}\sin 144$
3. π
4. $t = \frac{1}{2}\sin^{-1}\frac{2}{4.05} \approx 0.25824277$
5. (a) $z = 7x - 3y + 8$ (b) There are infinitely many such pairs. One pair is $(0, 0, 0)$ and $(1, \frac{-10}{3}, 3)$.