MATH 140A
Spring 2004
Exam II
April 6, 2004

**ANSWERS:**

**1.** A
**2.** D
**3.** C
**4.** C
**5.** B
**6.** B
**7.** A
**8.** D
**9.**
a) T b) F c) T d) T e) F f) T g) T h) F

**10.**
a) $f'(x) = -100(5x^4 - 9x^2)\sec^{100}(\cos(x^5 - 3x^3 + 1))\tan(\cos(x^5 - 3x^3 + 1))\sin(x^5 - 3x^3 + 1)$
b) $-\frac{2}{5}x^5 + \frac{6}{7}x^{7/6} + \cot(x) - \cos(x) + 5x + C$

**11.**
a) $8\ ft/sec$
b) $-\frac{3}{250}\ rad/sec$

**12.**
a) The critical points are $x = -2, 0, 2$.
b) $x = -2$ and $x = 2$ are local minimums, $x = 0$ is a local maximum.
c) The absolute maximum point is at $(-3, 21)$, the absolute minimum point is at $(-2, -4)$. The point $(2, -4)$ is NOT also an absolute minimum point since its x-coordinate is outside of the interval of $-3 \leq x \leq 1$.

**13.**
The optimal dimensions are $3\ ft$ x $3\ ft$ x $3\ ft$