# Answers to Math 241 Final, 1998

## Part I:

(1) (a) $\langle -9, 6, -2 \rangle$
(b) $11$
(c) $x = 11 - 9t$
$y = 3 + 6t$
$z = 8 - 2t$

(2) $3\pi/4$

(3) $\sqrt{29}/2$

(4) (a) $(2, \pi/2, 2\pi/3)$
(b) $(-3, 0, 0)$

(5) $xe^{xy}$

(6) (a) $1/12$
(b) $\pi/4$
(c) $2\pi$

(7) a saddle point

(8) $6x - 8y - z = 1$

(9) Abs. Max. is $10$
Abs. Min. is $6$

(10) $0$

## Part II:

(1) (a) Check that $3(2-t) - t + 4(2+t) = 14$ for all $t$.
(b) $5x + 7y - 2z = 6$

(2) Abs. Max. is $11/\sqrt{10}$
Abs. Min. is $-11/\sqrt{10}$

(3) $19\pi/15$

(4) $4/3$

(5) $\pi/2$