

# 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)  $\pi/2$