

ANSWERS TO MATH 241 FINAL, 1999

Part I:

- (1) (a) $\langle 0, 3, -3 \rangle$ (4) 3 (7) $(0, 0)$, saddle point
(b) 3 $(-2, 0)$, saddle point
(c) $\pi/4$ (5) (a) -1 $(-1, 1/2)$, local minimum
(d) $\langle -3, -6, -6 \rangle$ (b) 1 $(-1, -1/2)$, local maximum
- (2) $x + y + z = 3$ (6) (a) 8
(b) $16\pi/3$
(3) (a) $2/\sqrt{5}$ (c) $\pi\sqrt{2}/5$
(b) $\langle -4/5, 3/5 \rangle$

Part II:

- (1) There are infinitely many different correct answers.
One is the plane $x + 2y + z = 4$.
- (2) $9/2$
- (3) The maximum value is 15 (at $(1, 0)$).
The minimum value is 2 (at $(1/3, 1/4)$).
- (4) $15\pi/9$