Answers to Test 2, 1994

1. No. The function $f(x, y)$ approaches the value 0 as (x, y) approaches $(0, 0)$ along the y-axis. On the other hand, $f(x, y)$ approaches the value $1/2$ as (x, y) approaches $(0, 0)$ along the line $y = x$. Hence, the limit cannot exist.

2. $-5/\sqrt{10}$ (or $-\sqrt{5/2}$)

3. $3x + 3y - 2z = 2$

4. 26

5. $(3x^2y + y^2 - 1)e^st + (x^3 + 2xy)t^2e^{st}$

6. Global Maximum Value: 27

   Global Minimum Value: $-21/2$

7. The critical point $(1, 0)$ determines a local minimum.

   The critical point $(1, 1)$ determines a saddle point.

   The critical point $(1, 2)$ determines a local minimum.