Answers to Test 2, 1999

1. (a) 9
   (b) \(\sqrt{106}\)

2. 0

3. \((2x + yz + 1)(\sin(\sqrt{5}) - 2t) + xzs^2\cos(t) + (xy + 2)(2t s^3 - 2)\)

4. \(8x + 5y - z = 16\)

5. Maximum Value: 2
   Minimum Value: -2

6. Critical Points: the boundary points, that is \((x, y)\) satisfying \(x^2 + y^2 = 9\)
   Maximum Value: 16 at \((2, \pm \sqrt{5})\)
   Minimum Value: -16 at \((-2, \pm \sqrt{5})\)

7. The critical point \((0, 0)\) determines a saddle point.
   The critical point \((0, -4)\) determines a saddle point.
   The critical point \((1, -2)\) determines a local minimum.