

Homework Set # 6

1. Show that the ellipsoid $6x^2 + y^2 + 6y + z^2 = 15$ and the surface $z = x^2e^y - 4$ are tangent at their point of intersection $(1, 0, -3)$.
 2. (§3.1) Page 156: # 4, 11(a), 22, 25.
 3. (§3.2) Page 165: # 1.
 4. Show that if x and y are close to 0, then $\frac{\cos x}{\cos y} \approx 1 - \frac{x^2}{2} + \frac{y^2}{2}$.
 5. (§3.3) Page 182: # 4, 17, 20, 28, 39.
 6. Find and classify all critical points of $f(x, y) = \frac{1}{4}x^4 - \frac{2}{3}x^3 - 4xy + y^2 + 10$.
 7. (§3.4) Page 201: # 4, 21.
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