Name _____

56:271 Nonlinear Programming
Quiz #9 – Fall 2003

Consider the general NLP problem
Minimize f(x)
s.t. $g_i(x) \leq 0$, i=1,…m_1; $h_i(x)=0$, i=m_1+1,….m_1+m_2.

Classify each of the functions below as either a penalty function (which penalizes infeasibility) or a barrier function (which discourages an approach to the boundary of the feasible region).

Indicate **p** for penalty, **b** for barrier:

___ 1. $|y|^p$

___ 2. $\left[\max\{0, y\} \right]^2$

___ 3. $-\ln|y|$

___ 4. $\dfrac{1}{y^2}$

True (+) or False (o)?

___ 5. It would be possible to use barrier functions for the constraints $g_i(x) \leq 0$ and at the same time penalty functions for the constraints $h_i(x)=0$.

___ 6. It would be possible to use penalty functions for the constraints $g_i(x) \leq 0$ and at the same time barrier functions for the constraints $h_i(x)=0$.\

___ 7. When using a penalty function, one begins with a small multiplier and increase it after each unconstrained optimization.

___ 8. When using a barrier function, one begins with a small multiplier and increase it after each unconstrained optimization.

___ 9. When applying the penalty function method to the problem above, it is not necessary to compute derivatives.

10. SUMT is an acronym for Sequential U_____ M_____ Technique.