Worksheet 11    Math 2263    Spring 2018

Name: .................................................................

1) Find the discriminant of the functions below:
   (a) $f(x, y) = e^{-3x} \sin(2y)$
   (b) $f(s, t) = s^2 t e^{-st}$
   (c) $f(\theta, \phi) = \cos \theta \sin \phi$

2) Find the relative maxima, relative minima and saddle points for the given functions. Determine whether the function has an absolute maximum or absolute minimum.
   (a) $f(x, y) = 3x^2 + 3x + gy^2 - 7$
   (b) $g(x, y) = 4x^2 - 8xy + y^2 + 3y + 5$
   (c) $f(x, y) = x^3 + y^3 - 12x - 3y + 15$
   (d) $g(x, y) = e^x \cos y$
   (e) $g(x, y) = 5x - 4y^2 + x \ln y$, $y > 0$

3) Robert wants to build a rectangular wooden box. The plywood he will use for the bottom costs $2 per square foot. The pine for the sides costs $5 per square foot, and the oak for the top costs $7 per square foot. What should the dimensions of the box be to minimize the cost of a box with volume of 20 cubic feet?