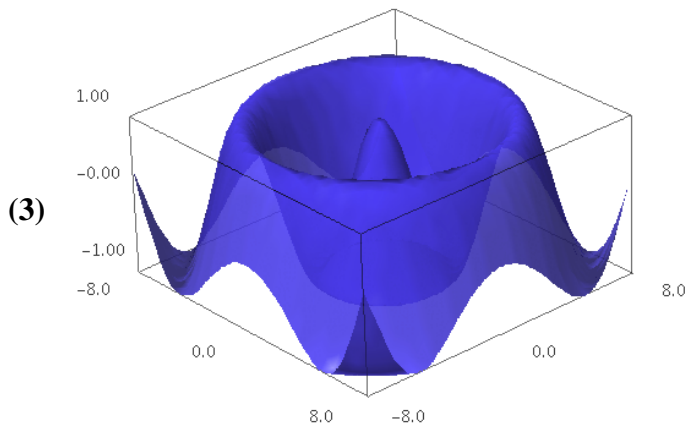
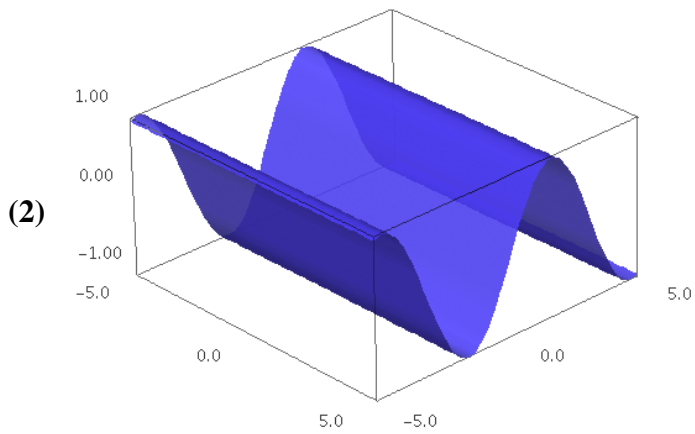
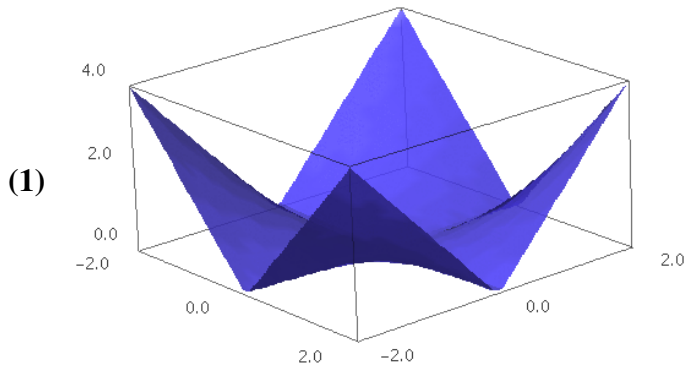


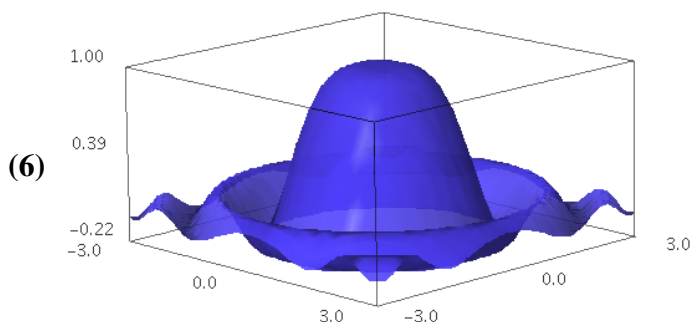
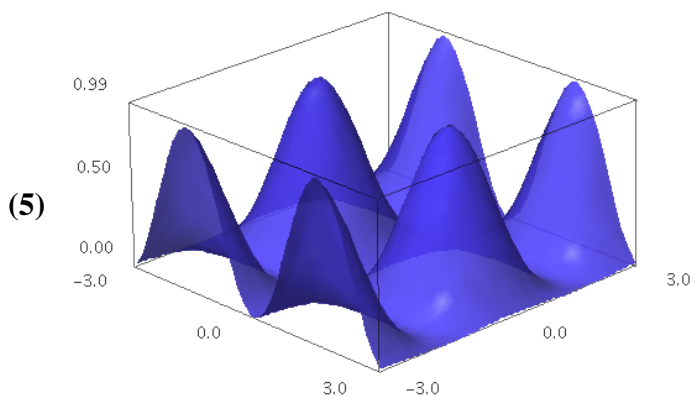
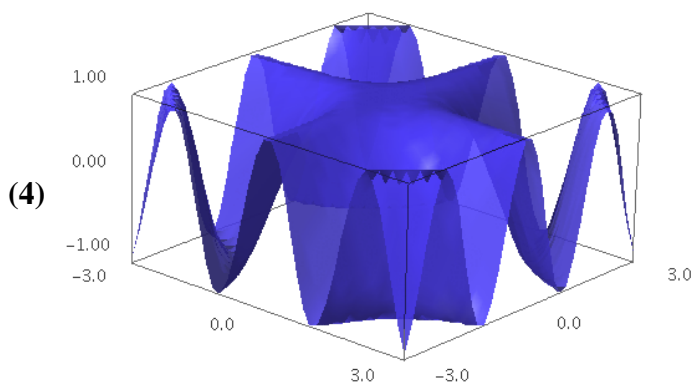
Problem Set #24

Due: Thursday, 5 April 2012

1. Match the equations (a)–(f) with the graphs (1)–(6). Give reasons for your choice.

- | | | |
|---|--------------------|-------------------------------|
| (a) $z = \cos(\sqrt{x^2 + y^2})$ | (b) $z = \sin(y)$ | (c) $z = \cos^2(x) \sin^2(y)$ |
| (d) $z = \frac{\sin(x^2 + y^2)}{x^2 + y^2}$ | (e) $z = \cos(xy)$ | (f) $z = x y $ |





2. Show that the function $f(x,y) = \frac{x^2y}{x^4 + y^2}$ does not have a limit at $(0,0)$.

3. (a) Fix constants b and a . Show that the Cobb-Douglas function $Q = bK^aL^{1-a}$ where $0 < a < 1$ satisfies the equation $K \frac{\partial Q}{\partial K} + L \frac{\partial Q}{\partial L} = Q$.

(b) Is there a function f which has the following partial derivatives? If so what is it? Are there any others?

$$f_x(x,y) = 4x^3y^2 - 3y^4$$

$$f_y(x,y) = 2x^4y - 12xy^3.$$