

Name: \_\_\_\_\_

**Directions:** Solve all problems.

1. [EC 11.2.{4-16} even]. In (a)-(g), find the limit if it exists, or show that it does not exist.

$$(a) \lim_{(x,y) \rightarrow (6,3)} xy \cos(x - 2y)$$

$$(c) \lim_{(x,y) \rightarrow (0,0)} \frac{6x^3y}{2x^4 + y^4}$$

$$(b) \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 + \sin^2 y}{2x^2 + y^2}$$

$$(d) \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 \sin^2 y}{x^2 + 2y^2}$$

$$(e) \lim_{(x,y) \rightarrow (0,0)} \frac{xy^4}{x^2 + y^8}$$

$$(f) \lim_{(x,y) \rightarrow (0,0)} \frac{x^4 - y^4}{x^2 + y^2}$$

$$(g) \lim_{(x,y,z) \rightarrow (0,0,0)} \frac{x^2 + 2y^2 + 3z^2}{x^2 + y^2 + z^2}$$

(h) Determine the set of points at which  $F(x, y) = \frac{x-y}{1+x^2+y^2}$  is continuous.