

# A Short Quiz

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October 12, 2009

1. Compute

$$\frac{\partial^2}{\partial x \partial y} \left( \frac{x}{x + \sin(x)y} \right).$$
$$\nabla \left( \frac{x}{x + \sin(x)y} \right).$$

2. **Bonus**

Prove the following: The gradient of a function  $f$  is perpendicular to the level surfaces of  $f$ .