**MATH 3A QUIZ 3 (TUESDAY)**

NAME:_____ SECTION (CIRCLE) 1A 1B 1C 1D 1E 1F

1. Find the first and the second derivative of the following function:

$$y = \sin(\sqrt{2x})$$

$$y' = \cos(\sqrt{2x}) \cdot \frac{1}{2\sqrt{2x}} \cdot 2 =$$

$$= \frac{\cos\sqrt{2x}}{\sqrt{2x}}$$

$$y'' = \frac{-\sin\sqrt{2x} \cdot \frac{1}{2\sqrt{2x}} \cdot 2 \cdot \sqrt{2x} - \frac{1}{2\sqrt{2x}} \cdot \cos\sqrt{2x}}{2x} =$$

$$= \frac{-\sin\sqrt{2x} - \frac{1}{2\sqrt{2x}}\cos\sqrt{2x}}{2x} =$$

$$= -\frac{(2\sqrt{2x}\sin\sqrt{2x} + \cos\sqrt{2x})}{4x\sqrt{2x}}$$

2. Find the derivative of the following function:

$$y = (\sqrt{x})^x$$

$$\ln y = x \ln \sqrt{x}$$

$$\frac{y'}{y} = \ln \sqrt{x} + x \cdot \frac{1}{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}} =$$

$$= \ln \sqrt{x} + \frac{1}{2}$$

$$y' = y \cdot \left(\ln \sqrt{x} + \frac{1}{2}\right)$$

$$y' = (\sqrt{x})^x \cdot \left(\ln \sqrt{x} + \frac{1}{2}\right)$$