

## Quiz 5

Name:

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This quiz has 4 questions worth 9 points on 1 pages. Try to do as many questions as possible. You can use your calculator.

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Suppose you're given an function  $y = x^x$

1. (1 point) Verify that  $(2, 4)$  is a point in the curve
2. (2 points) Rewrite the function as  $\ln y = \ln(x^x)$ , which simplifies to  $\ln y = x \ln x$ . Calculate the derivative  $\frac{dy}{dx}$  using the theory of implicit functions.
3. (2 points) Rewrite the function as  $y = (e^{\ln x})^x$ , which simplifies to  $y = e^{x \ln x}$ . Calculate the derivative  $\frac{dy}{dx}$  directly.
4. (4 points) Find the equation of the tangent line at point  $(1, 1)$ .