Classwork for 3.1 & 3.2
Applied Calculus I – Math 131.00(7,8) – Fall 2013

Show your work for credit.

1. For each function below, if you can take the derivative with techniques learned so far, perhaps after some arithmetic, then do so. If you cannot, write "NA" (not yet able).

   (a) \( e^t \) (a number)
   \[
   \frac{d}{dx}(e^t) = 0
   \]

   (b) \( x^2 \cdot 2^x \)
   NA

   (c) \( 5e^5 \) \( = (5e)^5 \)
   \[
   \frac{d}{ds}(5e) = \ln(5e) \cdot (5e)^5
   \]

   (d) \( e^{x+5} \) \( = e^x \cdot e^5 \)
   \[
   \frac{d}{ax}(e^x \cdot e^5) = e^x \cdot e^5
   \]

   (e) \( e^{5x} \) \( = (e^5)^x \)
   \[
   \frac{d}{dx}(e^{5x}) = \ln(e^5) \cdot (e^5)^x
   \]

   (f) \( x^n - \pi^x \)
   \[
   (n \pi^{n-1}) - \ln(\pi) \cdot \pi^x
   \]

   (g) \( (t^2 + t)(t^3 - 2) \)
   \[
   = t^5 - 2t + t^4 - 2t
   \]

   (h) \( \sqrt[3]{\theta} + \theta + 1 \)
   \[
   = 3 \cdot \theta + \theta + \theta
   \]

   (i) \( \frac{d}{d\theta}(\theta) \)
   \[
   = \theta^3 \cdot \frac{1}{3} \theta^2 - 4\theta - 5\theta
   \]

   (j) \( \frac{d}{d\theta}(\theta) \)
   \[
   = 3 \cdot \frac{1}{3} \theta^2 - 4\theta - 5\theta - 6\theta
   \]
2. Let \( c \) be the \( x \)-coordinate of the point of intersection between the \( x \)-axis and the line tangent to the graph of \( y = 2^x \) at \((0,2)\). Find the exact value of \( c \).

\[(1, 2)\]