

Lecture 15 Activity: Linear Approximation and Hyperbolic Functions

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math.dartmouth.edu/~blogsdon/activity15.pdf

1. Use linear approximation / differentials to estimate the number 9.9^4 without using a calculator.
2. Suppose that a cube has a side length of $20 \text{ cm} \pm 0.3 \text{ cm}$. What is the approximate margin of error in the volume of the cube? What is the relative error and the percentage error?
3. Use the definitions of the hyperbolic functions and the derivative rules to find the derivatives of $\tanh x$, $\operatorname{csch} x$, $\operatorname{sech} x$, and $\operatorname{coth} x$.
4. Find a formula for $\cosh^{-1} x$.