

Worksheet 11 for Math 115

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People who read the tabloids deserve to be lied to.
Jerry Seinfeld

1. Linear Approximation

Use linear approximation at $x = 0$ to approximate $\cos(0.12)$.

2. Optimization

Suppose we want to make a rectangular solid consisting of a square base with a surface area of 50 cm^2 . What dimensions will maximize the volume?

3. Related Rates

Suppose that Cheech and Chong are at the LA airport. They realize that they have some illegal substances in their coat pockets. They decide to drive back to their respective homes to empty their coats. Cheech lives directly North of the airport, and Chong lives directly East of the airport. Suppose that when Cheech is 3 miles from the airport, his speed is 12 miles an hour, and when Chong is 4 miles from the airport, his speed is 15 miles an hour. At this specific moment in time, at what rate is their distance between one another increasing?

4. Fundamental Theorem of calculus.

Suppose that f has an antiderivative which we will call F . Suppose also that $\int_0^2 f(t)dt = 5$. If f is an even function, and $F(0) = 9$, then find $F(-2)$.

Suppose that f has an antiderivative which we will call F . Suppose also that $\int_0^3 f(t)dt = 8$. If f is an odd function, and $F(0) = 4$, then find $F(-3)$.

5. Family of Functions

Let $f(a) = \frac{ab}{a^2 - 1}$, b a positive number.

(a) Thinking of the function f as a function of the variable a , find the critical values of f and decide if they are relative maximum or relative minimum, or neither.

(b) Find any inflection points of the function $f(a)$.

My fake plants died because I did not pretend to water them.

Mitch Hedberg