

Math 241, Spring 2007, Merit Worksheet 1

1. What is the definition of the derivative of $f(x)$? What is its meaning?
Draw a graph of a function which is not differentiable at $x = 0$.
2. Other side of this page.
3. Calculate the derivative:
 - (a) $\frac{d}{dx}(x \sin(7x^3))$,
 - (b) $\frac{d}{dx}\left(\frac{\log x}{x^2}\right)$,
 - (c) $\frac{d}{dx}(e^{\sin 2x})$.
4. What is the meaning of the integral?
5. Calculate the integrals:
 - (a) $\int_0^1 (x+1)e^{x^2+2x} dx$,
 - (b) $\int_{\pi/2}^{\pi} x \sin x dx$,
 - (c) $\int \sqrt{1+x^2} dx$.

Warm-up for next time:

Draw a picture that shows the triangle rule being used to find:

$$(2\vec{i} + 3\vec{j}) + (\vec{i} - 2\vec{j})$$