

Assignment #16

Due on Monday, December 3, 2012

Read Section 6.4, *Properties of the Derivative*, in the class lecture notes at <http://pages.pomona.edu/~ajr04747/>

Read Sections 3–1, 3–2, 3–3, 3–4, 3–5, 3–6 and 3–7, pp. 60–71, in *The Calculus Primer* by William L. Schaaf.

Do the following problems

1. In each of the following explain why f is differentiable in the given domain and compute f'
 - (a) $f(t) = 2 \cos t - 3 \sin t$ for all $t \in \mathbb{R}$.
 - (b) $f(t) = 2 - t^2 + \frac{1}{\sqrt{t}}$, for $t > 0$.
2. In each of the following explain why f is differentiable in the given domain and compute f'
 - (a) $f(t) = 2 \sin t \cos t$ for all $t \in \mathbb{R}$.
 - (b) $f(t) = t^3 \cos t$, for $t > 0$.
3. In each of the following explain why f is differentiable in the given domain and compute f'
 - (a) $f(t) = \sin(2t)$ for all $t \in \mathbb{R}$.
 - (b) $f(t) = \cos(t^3)$, for $t > 0$.
4. In each of the following explain why f is differentiable in the given domain and compute f'
 - (a) $f(x) = \frac{1}{\sqrt{x^2 + 1}}$ for all $x \in \mathbb{R}$.
 - (b) $f(x) = \tan(x)$, for $-\frac{\pi}{2} < x < \frac{\pi}{2}$.
5. Let $f(x) = \sqrt{1 - x^2}$, for $-1 \leq x \leq 1$.
 - (a) Explain why f is not differentiable at -1 or 1 .
 - (b) Explain why f is differentiable in the open interval $(-1, 1)$ and compute $f'(x)$ for $-1 < x < 1$.