

Problem Set 1 Answer Keys
Econ 2103A, Winter 2018

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Question 1: Keynesian consumption function and Canadian data

1. Calculate C/Y for each year. Plot it using excel chart function.
2. Secular stagnation is not observed (i.e., C/Y does not fall even if Y grows over time). Hence it does not support the Keynesian consumption function.

Question 2: Math review-Derivative

1. $f'(x) = b + 2cx$
2. $f'(x) = \log(x) + x^{\frac{1}{x}} = \log(x) + 1$
3. $f'(x) = b(ax)^{b-1} \times a = ab(ax)^{b-1}$.

Question 3: Math Review-(Unconstrained) Optimization

1. $f'(x) = -2x + 2$ and $f''(x) = -2$. $x = 1$ is the only value that makes $f'(x) = 0$ and $f''(x) < 0$. Hence $f(x)$ is maximized at $x = 1$.
2. $f'(x) = -x^3 + x^2 + 2x$ and $f''(x) = -3x^2 + 2x + 2$. At $x = -1$ and $x = 2$, we have $f'(x) = 0$ and $f''(x) < 0$. $f(-1) = \frac{29}{12}$ and $f(2) = \frac{14}{3}$. Hence $f(x)$ is maximized at $x = 2$.