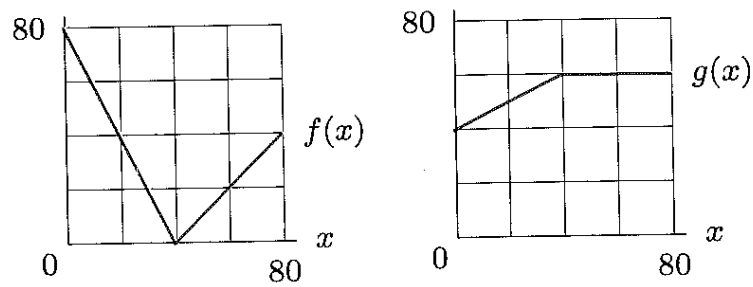
WEEKLY 4
APPLIED CALCULUS
DUE 09-17

Show your work!

(1) Pictured below are the graphs of two functions $u = f(x)$ and $v = g(x)$.



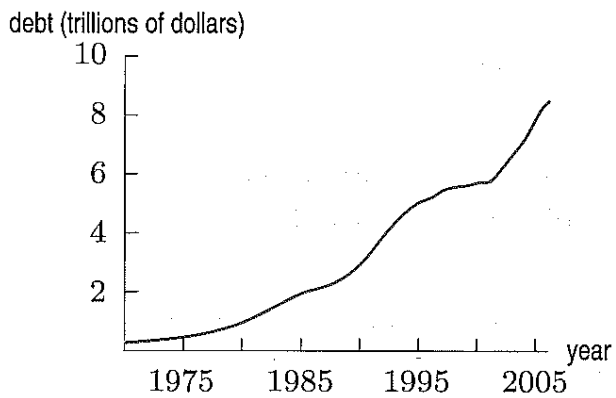
Find the value and derivative of $y = f(x)g(x)$ at the indicated points, if they exist.

(a) $y(10)$ and $y'(10)$.

(b) $y(40)$ and $y'(40)$.

(c) $y(70)$ and $y'(70)$.

(2) The graph below shows the accumulated federal debt since 1970. Sketch the derivative of this function. In economic terms, what does the derivative represent?



(3) (a) Use exponential rules to re-write 10^x as $e^{\square}$. (The answer to this part consists of figuring out what goes in the box.)

(b) Use your answer to (a) to find a formula for $(10^x)'$. **Do not** just give the rule; show your work!

(c) Use logarithm rules to re-write $\log_{10}(x)$ in terms of $\ln(x)$.

(d) Use your answer to (c) to find a formula for $\big(\log_{10}(x)\big)'$. **Do not** just give the rule; show your work!

- **Two** book problems: #11.5.59, 66.