This problem is intended to be used right after problem w2Dv2.

1. The goal of this problem is to calculate $\frac{d}{dx}\int_{2x}^{x^2} \ln(t)\,dt$ using the Fundamental Theorem of Calculus, Part II (FTCII) and then to double-check this calculation by using the Fundamental Theorem of Calculus, Part I (FTCI). Note that this second method is rarely possible: usually an FTCII-type question will involve an integral that you do not know how to calculate. You must be able to use FTCII as in parts (a)-(c) below.
   (a) Use FTCII to compute $\frac{d}{dx}\int_{1}^{x^2} \ln(t)\,dt$.
   (b) Use FTCII to compute $\frac{d}{dx}\int_{1}^{2x} \ln(t)\,dt$.
   (c) Use parts (a) and (b) to compute $\frac{d}{dx}\int_{2x}^{x^2} \ln(t)\,dt$.
   (d) Use your answer from problem w2Dv2 part (d) together with FTCI to compute $\int_{2x}^{x^2} \ln(t)\,dt$.
   (e) Take the derivative of your answer in part (d) to verify your answer from part (c).