

You have 20 minutes to take this quiz. Each problem will be graded for clarity of work as well as correctness, so show all work **clearly and in order**. Circle or otherwise indicate your final answers. Please note that there are problems on both the front and the back of this page.

1. (8 points) [Similar to #19, 5.2]

Calculate the derivative (with respect to x) of the function:

$$\int_{x^2}^1 (t - \sin^2 t) dt.$$

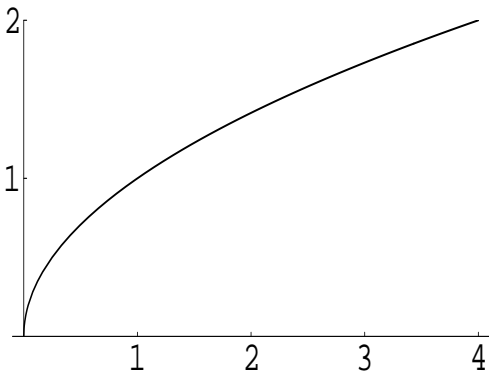
Turn over for more...

2. (12 points) [Similar to #6, 5.1 and #7, 5.3]

In this problem you will calculate the following definite integral two different ways.

$$\int_1^4 \sqrt{x} \, dx$$

(a) Approximate the definite integral above by calculating the lower sum with partition $P = \{1, 1.5, 3, 4\}$. Show all work clearly and make a sketch of this lower sum on the graph of $f(x) = \sqrt{x}$ provided.



What is x_2^* in your approximation above? _____

(b) Find the exact value of the definite integral using the Fundamental Theorem of Calculus.