Homework 8.5 – The Fundamental Theorem of Calculus (Part 2)

1. (1 pt) alfredLibrary/AUCI/chapter8/lesson5/quiz/FTCpart21pet.pg

Let $f(x) = \int_3^x \frac{t^6}{e^t + 2} dt$.

By Part 2 of the Fundamental Theorem of Calculus,

$f'(x) =$ _____,

and

$f'(2) =$ _____.

2. (1 pt) alfredLibrary/AUCI/chapter8/lesson5/FTC8pet.pg

Suppose $f(x) = \int_0^x \frac{t^2 - 25}{4 + \cos^2(t)} dt$.

For what value(s) of x does $f(x)$ have a local maximum? Enter a number, a list of numbers separated by commas, or *NONE*.

(HINT: Use Part 2 of the FTC to find $f'(x)$. Then perform a sign test.)

$x =$ _____

3. (1 pt) alfredLibrary/AUCI/chapter8/lesson5/FTC9pet.pg

Use Part 2 of the Fundamental Theorem of Calculus to find the derivative of

$$F(x) = \int_{3x}^{3} \sin(t^4)\, dt.$$

$F'(x) =$ _____

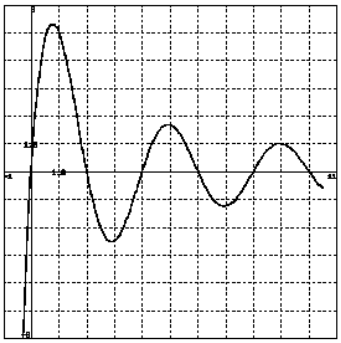
4. (1 pt) alfredLibrary/AUCI/chapter8/lesson5/FTC10pet.pg

If $f(x) = \int_1^{x^3} \sqrt{t^2 + 9}\, dt$,

then $f'(x) =$ _____.

5. (1 pt) alfredLibrary/AUCI/chapter8/lesson5/graphical.pg

Let $g(x) = \int_0^x f(t)\, dt$, where f is the function whose graph is shown. Answer the following questions only on the interval $[0, 10]$. Enter multiple answers as a comma-separated list. Click on the graph to enlarge the image.



(a) At what value(s) of x does g have a local maximum?

$x =$ _____

(b) At what value(s) of x does g have a local minimum?

$x =$ _____

(c) At what value(s) of x does g have an absolute maximum?

$x =$ _____