8.13 Arc Length

Calculus Name: _____ **CA #2**

1. Find an equation for the length of the curve $y = \cot 3x$ from $x = \frac{\pi}{7}$ to $x = \frac{\pi}{5}$. **Do Not Evaluate.**

2. **No Calculator.** Suppose $F(x) = \int_0^x \sqrt{3 - 4\cos^2 t}\ dt$. What is the length of the arc along the curve $y = F(x)$ for $0 \le x \le \frac{\pi}{3}$?

3. Set up an integral that will give the length of the curve from $x = 1$ to $x = 4$ for $y = \ln\frac{2}{x}$. **Do Not Evaluate.**

4. **No Calculator.** Let f be a function with derivative given by $f'(x) = \sqrt{x^2 + 6x + 8}$. Find the length of the graph of $y = f(x)$ from $x = 0$ to $x = 5$.

5. Let R be the region bounded by the graphs of $f(x) = x^2 + 1$ and $g(x) = -x^2 + 5$. Write an expression including one or more integrals that gives the length of the region R. **Do Not Evaluate.**

Answers to 8.13 CA #2

1. $\int_{\frac{\pi}{7}}^{\frac{\pi}{5}} \sqrt{1 + 9\csc^4 3x}\ dx$	2. 1	3. $\int_1^4 \sqrt{1 + \frac{1}{x^2}}\ dx$	4. $\frac{55}{2}$	5. $2\int_{-\sqrt{2}}^{\sqrt{2}} \sqrt{1 + 4x^2}\ dx$