CAMOSUN COLLEGE

Mathematics 100 Test #3A

Name: _____

Instructor: George Ballinger

Section: _____

Term: Fall, 2013

The Sharp EL-531 calculator may be used on this test.
Show all of your work in the space provided.
The number of marks for each question is indicated in brackets.

Mark: $\frac{\quad}{25}$

1. Find the derivative of $y = xe^{7x^2}$.

[2]

2. Find the following indefinite integrals.

(a) $\int \left(\frac{3x+1}{x} \right) dx$

[2]

(b) $\int \frac{e^{\sqrt{t}}}{\sqrt{t}}\, dt$

[2]

(c) $\int x\sqrt{5x+1}\, dx$

[3]

3. Use logarithmic differentiation to differentiate $y = (\ln x)^x$.

[3]

4. Evaluate $\int_{-2}^{4} (2x+4)^3 \, dx$

(a) by using antiderivatives and the Fundamental Theorem of Calculus.

[2]

(b) by using the limit of a Riemann sum definition of a definite integral.

[4]

5. Find the derivative of $f(x) = \log_2(8x + 3)$.

[1]

6.

(a) Use Simpson's Rule with $n = 4$ to approximate the integral $\int_0^2 \sqrt{4 - x^2}\, dx$ and round your approximation to four decimal places.

[2]

(b) Sketch the region of the *xy*-plane whose area is represented by the integral $\int_0^2 \sqrt{4 - x^2}\, dx$ and then find the exact value of the integral by using a geometry formula.

[2]

(c) Find the value of *c* predicted by the **Mean Value Theorem for Integrals** for the function $f(x) = \sqrt{4 - x^2}$ on the interval $[0, 2]$. Round your answer to four decimal places.

[2]