BC Calculus
Ch. 8 Quiz Information

Name: ___________________________________
No Calculator

Topics:

- Arc Length (not surface area),
- Euler's Method,
- Integration (problems will include substitution, parts, and partial fractions)

Opener:
Partial Fractions: Set up the partial fraction decomposition with the minimum number of constants. **<u>Don't solve for the constants and don't integrate</u>**

1) $\dfrac{2x+3}{(x+2)(x-3)(x-5)}$
2) $\dfrac{x^2-4}{(2x+1)^2(x-5)^3}$
3) $\dfrac{3x-4}{(x^2+5)(x-5)^2}$
4) What do you have to differently to start this problem? $\dfrac{x^3-3}{(x+2)(x)}$

Solve the integral:

5) $\int \dfrac{\ln(x)}{x^2}dx$	6) $\int x^3e^{2x}\ dx$
7) $\int \dfrac{x}{\sqrt{1+x}}dx$	8) $\int \dfrac{1}{x^2-6x+8}$

MC

1)	Given that $y(1) = -3$ and $\frac{dy}{dx} = 2x + y$, what is the approximation for $y(2)$ if Euler's method is used with a step size of 0.5, starting at $x = 1$? (A) -5 (B) -4.25 (C) -4 (D) -3.75 (E) -3.5
2)	Which of the following integrals gives the length of the graph of $y = \tan x$ between $x = a$ and $x = b$, where $0 < a < b < \frac{\pi}{2}$? (A) $\int_a^b \sqrt{x^2 + \tan^2 x}\, dx$ (B) $\int_a^b \sqrt{x + \tan x}\, dx$ (C) $\int_a^b \sqrt{1 + \sec^2 x}\, dx$ (D) $\int_a^b \sqrt{1 + \tan^2 x}\, dx$ (E) $\int_a^b \sqrt{1 + \sec^4 x}\, dx$
3)	Which of the following is equal to $\int \frac{1}{\sqrt{25 - x^2}}\, dx$? (A) $\arcsin \frac{x}{5} + C$ (B) $\arcsin x + C$ (C) $\frac{1}{5} \arcsin \frac{x}{5} + C$ (D) $\sqrt{25 - x^2} + C$ (E) $2\sqrt{25 - x^2} + C$
4)	$\int \frac{dx}{(x-1)(x+2)} =$ (A) $\frac{1}{3} \ln \left\lvert \frac{x-1}{x+2} \right\rvert + C$ (B) $\frac{1}{3} \ln \left\lvert \frac{x+2}{x-1} \right\rvert + C$ (C) $\frac{1}{3} \ln \lvert (x-1)(x+2) \rvert + C$ (D) $(\ln\lvert x-1 \rvert)(\ln\lvert x+2 \rvert) + C$ (E) $\ln \lvert (x-1)(x+2)^2 \rvert + C$
5)	$\int_0^1 \frac{x^2}{x^2+1}\, dx =$ (A) $\frac{4-\pi}{4}$ (B) $\ln 2$ (C) 0 (D) $\frac{1}{2}\ln 2$ (E) $\frac{4+\pi}{4}$
6)	<table><tr><td>x</td><td>2</td><td>2.2</td><td>2.4</td></tr><tr><td>$f'(x)$</td><td>–0.5</td><td>–0.3</td><td>–0.1</td></tr></table> Let $y = f(x)$ de the solution to the differential equation $\frac{dy}{dx} = f'(x)$ with initial condition $f(2) = 3$. Selected values of f' are given in the table above. What is the approximation for $f(2.4)$ if Euler's method is used., starting at $x = 2$ with two steps of equal size? (A) 2.80 (B) 2.82 (C) 2.84 (D) 2.92 (E) 3.16