Name: _____

Instructor: _____

Math 10560, Quiz 6 Tutorial
February 28, 2017

- The Honor Code is in effect for this quiz. All work is to be your own.
- No calculators.
- The quiz lasts for 25 Minutes .
- Be sure that your name is on every page in case pages become detached.
- Be sure that you have all 5 pages of the test.

PLEASE MARK YOUR ANSWERS WITH AN X, not a circle!

1.	(a)	(b)	(c)	(d)	(e)
2.	(a)	(b)	(c)	(d)	(e)
3.	(a)	(b)	(c)	(d)	(e)
4.	(a)	(b)	(c)	(d)	(e)

Please do NOT write in this box.

Multiple Choice _____

5. _____

Total _____

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Multiple Choice

1.(2 pts) Compute the integral

$$\int_0^2 \frac{x}{x^2 + \sqrt[3]{x}}.\, dx$$

Hint: a rationalizing substitution might help.

(a) $\dfrac{3\ln(2)}{5}$ (b) $\dfrac{\ln(32)}{15}$ (c) $\dfrac{5\ln(2)}{3}$

(d) $\dfrac{3\ln(\sqrt[3]{32}+1)}{5}$ (e) $\ln(32)$

2.(2 pts) The value of

$$\int_0^2 \cos^{46} x \sin^3 x\, dx$$

is

(a) $\dfrac{\sin^{49}(2)}{49} - \dfrac{\sin^{47}(2)}{47}$

(b) $\dfrac{\cos^{49}(2)}{49} - \dfrac{\cos^{47}(2)}{47} - \dfrac{1}{49} + \dfrac{1}{47}$

(c) $\dfrac{\cos^{47}(2)}{47}$

(d) $\dfrac{\sin^{47}(2)}{47} - \dfrac{\sin^{49}(2)}{49}$

(e) $\dfrac{\cos^{49}(2)}{49} - \dfrac{\cos^{47}(2)}{47} + \dfrac{1}{49} - \dfrac{1}{47}$

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3.(2 pts) Which of the following is the definite integral

$$\int_2^4 \frac{8x}{x^2+6x-7}dx.$$

(a) $5\ln(7)+2\ln(3)-5\ln(5)$

(b) $5\ln(7)-2\ln(3)-5\ln(5)$

(c) $7\ln(2)+\ln(3)$

(d) $7\ln(11)-\ln(3)-7\ln(9)$

(e) $7\ln(11)+\ln(3)-7\ln(9)$

4.(2 pts) Use the trapezoidal rule with $n=3$ to approximate $\int_1^4 \frac{2}{x+1}dx$.

(Note: The exact value of the integral is $\ln\frac{25}{4}$ (you do not need to verify this or use it in any way to complete this problem.))

(a) $1+\frac{4}{3}+1+\frac{2}{5}$

(b) $\frac{1}{2}\left(1+\frac{4}{3}+1+\frac{2}{5}\right)$

(c) $1+\frac{2}{3}+\frac{1}{2}+\frac{2}{5}$

(d) $\frac{1}{2}\left(1+\frac{2}{3}+\frac{1}{2}+\frac{2}{5}\right)$

(e) 1.5

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5.(2 pts) Consider the integral

$$\int_1^3 x^5\,dx.$$

Part 1 Estimate the integral using Simpson's Rule and n = 4. You do not need to simplify your answer.

Part 2 Estimate the error using the error bound for Simpson's Rule:

$$|E_S| \leq \frac{K(b-a)^5}{180n^4}, \quad K \geq |f^{(4)}(x)|.$$

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The following is the list of useful trigonometric formulas:

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$\sin^2 x = \frac{1}{2}(1 - \cos 2x)$$

$$\cos^2 x = \frac{1}{2}(1 + \cos 2x)$$

$$\sin 2x = 2 \sin x \cos x$$

$$\sin x \cos y = \frac{1}{2}\big(\sin(x - y) + \sin(x + y)\big)$$

$$\sin x \sin y = \frac{1}{2}\big(\cos(x - y) - \cos(x + y)\big)$$

$$\cos x \cos y = \frac{1}{2}\big(\cos(x - y) + \cos(x + y)\big)$$

$$\int \sec \theta = \ln |\sec \theta + \tan \theta| + C$$

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Total _____