Name: _____

Instructor: _____

Math 10560, Quiz 6 Tutorial
March 7, 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)
5.	(a)	(b)	(c)	(d)	(e)

Name: _____

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Multiple Choice

1.(2 pts) The length of the curve $y = \cos(x^2)$ from $(0, 1)$ to $(1, \cos(1))$ is given by:

(a) $\displaystyle\int_0^1 \sqrt{1 - 2x\sin(x^2)}dx$

(b) $\displaystyle\int_0^1 \sqrt{1 + 4x^2\cos^2(x^2)}dx$

(c) $\displaystyle\int_0^1 \sqrt{1 + x^2\sin^2(x^2)}dx$

(d) $\displaystyle\int_0^1 \sqrt{1 + 4x^2\sin^2(x^2)}dx$

(e) $\displaystyle\int_0^1 \sqrt{1 + \cos^2(x^2)}dx$

2.(2 pts) The improper integral $\displaystyle\int_{e^2}^{\infty} \frac{1}{x(\ln(x))^2}dx$

(a) converges to $-\frac{1}{2}$ (b) converges to $\frac{1}{2}$ (c) diverges

(d) converges to 0 (e) converges to 1

Name: _____

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3.(2 pts) Using Euler's method with step size 1, which of the following gives an approximation for $y(3)$, where y is the solution of

$$y' = xy - x^2$$

with $y(1) = 2$?

(a) 3 (b) 0 (c) 4 (d) 2 (e) 5

4.(2 pts) What is the value of the improper integral

$$\int_0^\infty \frac{e^x}{e^{2x}+1}\,dx?$$

Hint: A substitution may help.

(a) 1 (b) $\frac{\pi}{4}$ (c) -1 (d) $-\frac{\pi}{4}$ (e) ∞

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5.(2 pts) Which of the following integrals gives the length of the curve $y = -\ln(\cos x)$ from $x = 0$ to $x = \dfrac{\pi}{4}$?

(a) $\displaystyle\int_0^{\pi/4} \cos x \, dx$

(b) $\displaystyle\int_0^{\pi/4} \sqrt{1 + \csc^2 x} \, dx$

(c) $\displaystyle\int_0^{\pi/4} \tan x \, dx$

(d) $\displaystyle\int_0^{\pi/4} \sin x \, dx$

(e) $\displaystyle\int_0^{\pi/4} \sec x \, dx$

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The following is the list of useful trigonometric formulas:

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

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

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

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

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

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

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

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

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