Name: _____

Instructor: _____

Math 10560, Quiz 3 Tutorial
February 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 4 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)

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Multiple Choice

1.(6 pts) Evaluate $\displaystyle\int \frac{1}{x\sqrt{1-(\ln x)^2}}\,dx$

Notation: $\arcsin(x) = \sin^{-1} x$, and $\arctan(x) = \tan^{-1} x$

(a) $\arcsin((\ln x)^2) + C$

(b) $\arcsin(\ln x) + C$

(c) $\ln(1-(\ln x)^2) + C$

(d) $\ln(\sqrt{1-(\ln x)^2}) + C$

(e) $\arctan(\ln x) + C$

2.(6 pts) Simplify the function

$$\tan\left(\cos^{-1}\left(\frac{x}{2}\right)\right).$$

(a) $\dfrac{\sqrt{4-x^2}}{4}$

(b) $\dfrac{x}{\sqrt{4-x^2}}$

(c) $\dfrac{\sqrt{4-x^2}}{2}$

(d) $\dfrac{\sqrt{4-x^2}}{x}$

(e) $\sqrt{4-x^2}$

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3.(6 pts) Find the limit

$$\lim_{x\to\infty} x\sin(\pi/x)$$

(a) $\frac{3}{2}$ (b) 1 (c) $-\pi$ (d) π (e) $\frac{\pi}{2}$

4.(6 pts) Evaluate $\frac{dy}{dx}$ if

$$y = \ln(\sin^{-1}(e^x)).$$

(a) $-\frac{e^x \cot^2(e^x)}{\sin^{-1}(e^x)}$

(b) $\frac{1}{\sin^{-1}(e^x)}$

(c) $\frac{e^x}{\sin^{-1}(e^x)\sqrt{1-e^{2x}}}$

(d) $\frac{e^x}{\sin^{-1}(e^x)\sqrt{4-e^x}}$

(e) $\frac{1}{\sin^{-1}(e^x)\sqrt{1-e^{2x}}}$

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5.(6 pts) Evaluate the limit

$$\lim_{x\to 0} \frac{\ln(\cos(x))}{x^2}.$$

(a) $-\frac{1}{2}$ (b) $\frac{1}{2}$ (c) $e^{\frac{1}{2}}$ (d) ∞ (e) $e^{-\frac{1}{2}}$

The following is the list of useful trigonometric formulas:

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

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

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

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

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

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

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

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

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