

Name: \_\_\_\_\_ 3/5/2015  
Math 202 Quiz 1

**Directions** Answer all questions in the space provided and box your final answers. Good luck!

1. (4 points) Which of the following is correct?

$$\cos(\cos^{-1}(\pi/2)) = \pi/2 \quad \sin^{-1}(\sin(3\pi/2)) = 3\pi/2 \quad \cos^{-1}(\cos(\pi/2)) = \pi/2$$

2. (4 points) Find  $(f^{-1})'(a)$ , where  $f(x) = 4x^5 + 2x - 1$  and  $a = 5$ .

3. (4 points) Suppose a sample of radioactive material takes 6 days to decay to 85% of its original mass. Assuming exponential decay, find the *half-life* of this material.

4. Differentiate the following functions.

(a) (4 points)  $f(x) = \ln\left(\frac{e^x}{x}\right)$

(b) (4 points)  $g(x) = \pi^{x^2}$

5. Evaluate the following integral.

$$\int_0^{\pi/2} \frac{\cos x}{4 + \sin^2 x} dx$$

6. Evaluate each of the following limits.

(a) (4 points)  $\lim_{x \rightarrow \infty} \frac{4x^2 + 3x - e^x}{3x^2 + e^x}$

(b) (4 points)  $\lim_{t \rightarrow \infty} \left(1 + \frac{1}{t}\right)^t$