

Math 175 Section 4

Name: _____

Exam 1 Spring 2012

Show all your steps and simplify your answers. You must show work to receive credit.

1. Evaluate the integral $\int (x^{3/2} + 8)^5 \sqrt{x} dx$. If you make a substitution, be sure to indicate it. (6 pts)

2. Find the exact value of the following expressions:

a) $\arcsin\left(-\frac{\sqrt{3}}{2}\right)$ (7 pts)

b) $\cos^{-1}\left(\cos\left(\frac{7\pi}{6}\right)\right)$ (8 pts)

3. Draw a right triangle and use it to simplify the expression: $2\tan\left(\arccos\left(\frac{x}{3}\right)\right)$ (8 pts)

4. a) Let $y = \cos^{-1}x$. Use the technique of implicit differentiation to show that

$$\frac{dy}{dx} = \frac{-1}{\sqrt{1-x^2}}$$

(8 pts)

b) Find the derivative of $f(y) = y \cos^{-1}(1-y)$. Simplify your answer.

(8 pts)

5. Evaluate the following limits. Remember to indicate indeterminate forms where appropriate.

a) $\lim_{x \rightarrow 0} \frac{1 - \cos 3x}{x^2}$

(7 pts)

$$\text{b) } \lim_{x \rightarrow 0} (1 + 3x)^{\frac{2}{x}}$$

(8 pts)

6. Evaluate the following integrals using any method:

$$\text{a) } \int \frac{4}{16t^2 + 25} dt$$

(10 pts)

$$\text{c) } \int \sin^3 \theta \cos^4 \theta d\theta$$

(10 pts)

$$d) \int_0^{\ln 2} x e^x dx$$

(10 pts)

$$e) \int \sin^2 x dx$$

(10 pts)

Total (out of
100 points):