TEST #1

Math 142 **Name:** _____

Problem	**1**	**2**	**3**	**4**	**5**	**Total**
Possible Score	**40**	**40**	**40**	**40**	**40**	**200**
Your Score						

SHOW ALL WORK. Any solution that is not accompanied by the appropriate work necessary for solving the problem will receive no credit. Do not use your calculator to evaluate any limits, derivatives, or integrals. If you need more space, you may use the back of the page.

TRIG IDENTITIES

- $\sin^2(\theta) + \cos^2(\theta) = 1$
- $\tan^2(\theta) + 1 = \sec^2(\theta)$
- $\cos^2(\theta) = \frac{1}{2}(1 + \cos(2\theta))$
- $\sin^2(\theta) = \frac{1}{2}(1 - \cos(2\theta))$
- $\sin(2\theta) = 2\sin(\theta)\cos(\theta)$
- $\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)$
- $\sec(\theta) = \dfrac{1}{\cos(\theta)} \Rightarrow \cos(\theta) = \dfrac{1}{\sec(\theta)}$
- $\csc(\theta) = \dfrac{1}{\sin(\theta)} \Rightarrow \sin(\theta) = \dfrac{1}{\csc(\theta)}$
- $\tan(\theta) = \dfrac{\sin(\theta)}{\cos(\theta)}$
- $\cot(\theta) = \dfrac{\cos(\theta)}{\sin(\theta)}$

1. (40 pts) Evaluate $\displaystyle\int \frac{5x^2 - 16x + 13}{(3x - 1)(x^2 + 4)}\, dx$

2. (40 pts) Evaluate ONE of the following:

(a) $\int x^3 \sqrt{x+2}\, dx$

(b) $\int \tan^3(x) \sin^2(x) \sec^2(x)\, dx$

(c) $\int \frac{6}{25x^2 + 20x + 8}\, dx$ (**Hint:** complete the square)

3. (40 pts) Evaluate $\int \frac{x^2}{\sqrt{9-4x^2}}\,dx$

4. (40 pts) Evaluate $\int e^{3x}(x^2 - 4x + 5)\, dx$

5. (40 pts) Evaluate ONE of the following:

(a) $\displaystyle\int \frac{x}{1-x^2+\sqrt{1-x^2}}\,dx$

(b) $\displaystyle\int \frac{dx}{\sqrt{4x^2-4x+5}}$ (**Hint:** complete the square)

(c) $\displaystyle\int \frac{3x-4}{2+\sqrt{x}}\,dx$