Due at the beginning of class on the day of Test 1

Direction: Solve the problems in this worksheet on separate sheets of paper. Write your solution neatly. Use standard size paper. Clearly label each problem, and include each problem in the correct order. No ragged edges. Staple multiple pages. At the top of the first page put your name, Math 2414, and the title of the worksheet.Show all work to justify your answer. Answer with insufficient work will receive no credit.

Problem 1: Use basic rules to find indefinite integrals

Find the indefinite integrals (show all work):

1. $\int (9x^8 - 2x - 6)dx$
2. $\int (\sqrt[4]{x^3} + 1)dx$
3. $\int (\frac{1}{5} - \frac{2}{x})dx$
4. $\int (\sec(x)\tan(x) - 2e^x)dx$
5. $\int \frac{dx}{x\sqrt{x^2-1}}$
6. $\int \frac{dx}{x^2+3}$

Problem 2: Find integrals by rewriting and/or u-substitution

Find the indefinite integrals (show all work):

1. $\int \frac{x+6}{\sqrt{x}}dx$
2. $\int \sec(x)(\tan(x) - \sec(x))dx$
3. $\int \frac{1+x}{1+x^2}dx$ (Hint: separate numerator)
4. $\int \frac{x^3}{\sqrt{1+x^4}}dx$
5. $\int \cos(6x)dx$
6. $\int x\sin(x^2)dx$

Problem 3: Find definite integrals by u-substitution

Find the definite integrals (show all work):

1. $\int_{-1}^{1} x(x^2+1)^3dx$
2. $\int_{1/6}^{1/2} \csc(\pi x)\cot(\pi x)dx$
3. $\int_{0}^{\pi/2} \cos(x)\sin(\sin(x))dx$
4. $\int_{1}^{9} \frac{1}{\sqrt{x}(1+\sqrt{x})^2}dx$

Problem 4: Integrals that involve exponential and log functions

Find the integrals (show all work):

1. $\int \frac{x}{x^2-3}dx$
2. $\int \frac{\cos(x)}{1+\sin(x)}dx$
3. $\int_{-1}^{1} \frac{1}{2x+3}dx$
4. $\int_{e}^{e^2} \frac{dx}{x\ln(x)}$
5. $\int e^{5x-3}dx$
6. $\int \frac{5-e^x}{e^{2x}}dx$
7. $\int_{0}^{1} xe^{-x^2}dx$
8. $\int_{0}^{2} \frac{e^{4x}}{1+e^{4x}}dx$

Problem 5: Integrals that involve inverse trig functions

Find the integrals (show all work):

1. $\displaystyle\int \frac{12}{1+9x^2}\,dx$
2. $\displaystyle\int \frac{x}{\sqrt{1-x^4}}\,dx$
3. $\displaystyle\int_1^7 \frac{1}{9+(x+2)^2}\,dx$
4. $\displaystyle\int_{\ln 2}^{\ln 4} \frac{e^{-x}}{\sqrt{1-e^{-2x}}}\,dx$
5. $\displaystyle\int_0^{\pi/2} \frac{\cos(x)}{1+\sin^2(x)}\,dx$
6. $\displaystyle\int_0^2 \frac{dx}{x^2-2x+2}$ (Hint: complete the square)