7.1 Homework **NAME**_____

1. For each integral decide which of the following applies: 1) nothing is needed, 2) algebra or a trig identity is needed, 3) substitution is needed, or 4) can't be done by the techniques in Calculus I. Then evaluate each integral (except for the 4th type of course).

A. $\int \left(x^3+1\right)dx$ $\int x^2\left(x^3+1\right)^4 dx$ $\int \sqrt{x^3+1}dx$ $\int \left(x^3+1\right)^2 dx$

B. $\int \sqrt{x}\left(1-x^2\right)dx$ $\int \sqrt{1-x^2}dx$ $\int \frac{1}{\sqrt{1-x^2}}dx$ $\int \frac{xdx}{\sqrt{1-x^2}}$

C. $\int \cos^2 x \sin^3 x dx$ $\int \sqrt{1-\cos^2 x}dx$ $\int \frac{dx}{\cos^2 x}$ $\int \frac{dx}{\cos x\sqrt{\sin x}}$

D. $\int \tan x \sec x dx$ $\int \tan x \cos x dx$ $\int \frac{\sec^2 x}{\sqrt{\tan x}}dx$ $\int \frac{dx}{\tan x+1}$

E. $\int e^{-x^2}dx$ $\int \frac{e^x}{3+e^x}dx$ $\int \left(e^x+3\right)dx$ $\int \frac{\ln\left(e^{2x}\right)}{x^2}dx$

2. If $\int_a^b f(x)dx = K$, evaluate the following integrals in terms of *K*. If a substitution is needed, include the integral expressed properly in terms of *u* or *w*.

A. $\int_a^b f(t)dt =$

B. $\int_{a+5}^{b+5} f(x-5)dx =$

C. $\int_a^b \left(f(x)+5\right)dx =$

D. $\int_{a/5}^{b/5} f(5x)dx =$

E. $\int_b^a \frac{f(x)}{5}dx =$

3. Suppose $\int_3^6 f(z)dz = 4$. Determine the missing information so that the integral can be evaluated, then evaluate the integral.

A. $\int_{\_\_\_}^{\_\_\_} f(5z)dz =$

B. $\int_{-1}^{2} f(\_\_\_\_\_)dz =$