RECOGNIZING INTEGRALS   Name_____

Although the integrals in each group below have similarities, they require different approaches. For
each integral decide which of the following is needed: 1) substitution, 2) algebra or a trig identity,
3) nothing needed, or 4) can't be done by the techniques in math 124. Then evaluate each integral
(except for the 4th type of course).

1. A. $\int (x^3 + 1) dx$

    B. $\int x^2 (x^3 + 1)^4 dx$

    C. $\int \sqrt{x^3 + 1} dx$

    D. $\int (x^3 + 1)^2 dx$

2. A. $\int e^{-x^2} dx$

    B. $\int \dfrac{e^x}{3 + e^x} dx$

    C. $\int (e^x + 3) dx$

    D. $\int \dfrac{\ln(e^{2x})}{x^2} dx$

3. A. $\int \sqrt{x} (1 - x^2) dx$

    B. $\int \sqrt{1 - x^2} dx$

    C. $\int \dfrac{1}{\sqrt{1 - x^2}} dx$

    D. $\int \dfrac{x\,dx}{\sqrt{1 - x^2}}$

4. A. $\int \cos\left(\dfrac{\pi}{4}\right) dx$

    B. $\int \sqrt{1 - \cos^2 x} dx$

    C. $\int \dfrac{dx}{\cos x \sqrt{\sin x}}$

    D. $\int \dfrac{\cos x}{\sqrt{\sin x}} dx$

5. A. $\int \tan^2 x \sec^2 x\, dx$

    B. $\int \sec x \tan x\, dx$

    C. $\int \tan x \cos x\, dx$

    D. $\int (\tan x + 1)^{-1} dx$