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#41 RECOGNIZING INTEGRALS 7.1

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 Calculus I. 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. $\int \frac{e^x}{3+e^x}\,dx$

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

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

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

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

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

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

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

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

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

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

5. A. $\int \tan(3x)\sec(3x)dx$

B. $\int \frac{dx}{\cos^2 x}$

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

D. $\int \frac{dx}{\tan x + 1}$