

Some Integration Review (Page 1 of 2)

Basic Forms: Be sure to know all derivatives and integrals on the review worksheet.

$$\int \frac{1}{\sqrt{a^2 - x^2}} dx$$

$$\int \frac{1}{a^2 + x^2} dx$$

$$\int \frac{1}{x\sqrt{x^2 - a^2}} dx$$

Beware of Similar Integrals

$$\textcircled{1} \int \frac{4}{x^2 + 9} dx$$

$$\textcircled{2} \int \frac{4x}{x^2 + 9} dx$$

$$\textcircled{3} \int \frac{4x^2}{x^2 + 9} dx$$

Long Division: Use to simplify improper rational expressions.

Inverse Trig. Forms

$$\textcircled{4} \int \frac{x^2}{\sqrt{16 - x^6}} dx$$

$$\textcircled{5} \int \frac{1}{\sqrt{2 - 2x - x^2}} dx$$

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Multiplying by a Special 1

$$\textcircled{6} \int \frac{1}{2e^x - 3} dx$$

Break Apart

$$\textcircled{7} \int \frac{x+3}{\sqrt{4-x^2}} dx$$

$$\textcircled{8} \int \frac{e^{5x} + e - e^{-2x}}{e^{3x}} dx$$

u-Substitution

Look for an "inside function" whose derivative is there too.

$$\textcircled{9} \int \frac{e^{1/t}}{t^2} dt$$

Trig. Identities: Don't Forget: $\frac{1}{\cos x} = \sec x$, $\frac{1}{\cot x} = \tan x$, etc.

Also: $\cos^2 x + \sin^2 x = 1$
 $\cos^2 x - \sin^2 x = \cos 2x$
 $2 \sin x \cos x = \sin 2x$

} You must know and be ready to use these at any time.