

**Problem 1.**

In each part, find the integral.

A. 
$$\int \frac{x^2}{(4-x^2)^{3/2}} dx$$

B. 
$$\int x \cos(2x) dx.$$

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

D. 
$$\int \ln(x) dx$$

E. 
$$\int x^2 \ln(x) dx$$

F. 
$$\int \sqrt{4+x^2} dx.$$

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

H. 
$$\int \frac{x-1}{x^2+2x+1} dx$$

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**Problem 2.** In each part, give the *form* of the partial fraction decomposition. This is a formula involving undetermined coefficients. **Do not find the coefficients!** (No calculation is required).

A.

$$\frac{x^3 + 2x + 1}{(x - 1)(x - 2)(x + 3)}$$

B.

$$\frac{1}{x(x^2 + 1)}$$

C.

$$\frac{x^4 + 1}{x(x^2 + 1)^2}$$

D.

$$\frac{x^3}{(x - 2)^2(x + 2)^2(x - 1)}$$

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**Problem 3.** In each part, find the partial fraction decomposition of the given rational function (i.e., find the coefficients).

A.

$$\frac{5x - 1}{x(x - 1)(x + 1)}$$

B.

$$\frac{x^2 + 1}{x^2(x - 1)}$$

C.

$$\frac{2x^3 + 2x^2 - 1}{x^2(x^2 + 1)}$$

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# EXAM

Practice for Second Exam

Math 1352-006, Fall 2003

Nov 4, 2003

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- Use the Reduction Formulas sheet
- Try to do the problems before looking at the answers.

Good luck!