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. \[ \int \frac{x-1}{x^2 + 2x + 1} \, dx \]
**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. \[ \frac{x^3 + 1}{x(x^2 + 1)^2} \]

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. \[ \frac{2x^3 + 2x^2 - 1}{x^2(x^2 + 1)} \]
EXAM

Practice for Second Exam

Math 1352-006, Fall 2003

Nov 4, 2003

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

Good luck!