

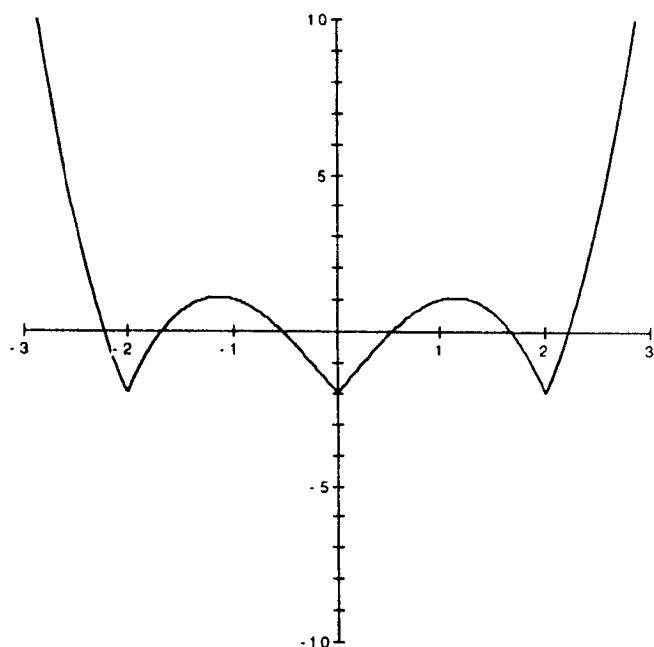
Math 17B
Kouba
Even and Odd Functions

Knowing if a function is even or odd can sometimes lead to a relatively easy solution to a definite integral.

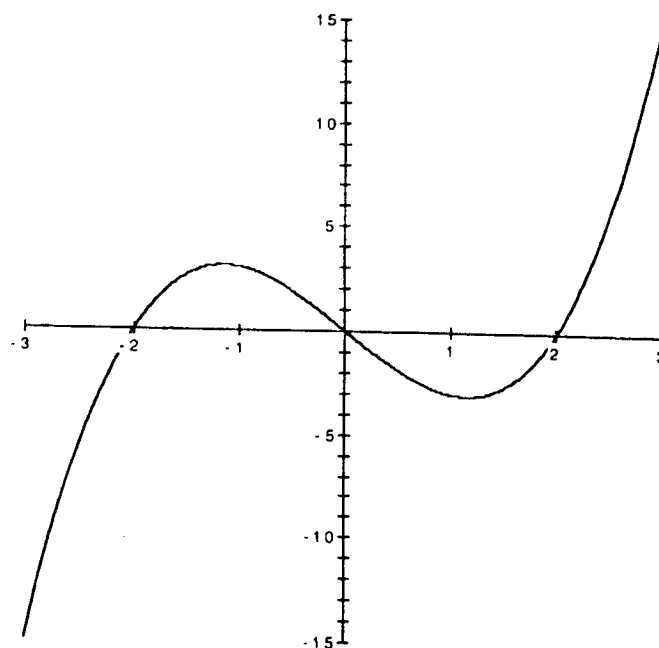
DEFINITIONS : Function f is *even* if $f(x) = f(-x)$. Function f is *odd* if $f(x) = -f(-x)$.

EXAMPLE:

f is even



f is odd



REMARKS:

- I. If f is even then $\int_0^a f(x) dx = \int_{-a}^0 f(x) dx$ so that $\int_{-a}^a f(x) dx = 2 \int_0^a f(x) dx$.
- II. If f is odd then $\int_0^a f(x) dx = - \int_{-a}^0 f(x) dx$ so that $\int_{-a}^a f(x) dx = 0$.

PROBLEM: Show that $f(x) = x \sqrt{x^2 + \cos x}$ is an odd function, then evaluate the definite integral $\int_{-5}^5 x \sqrt{x^2 + \cos x} dx$.