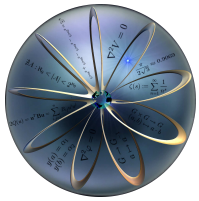

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rectification of antiperiodic function

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Synonym	rectification
Related topic	MaximalNumber
Related topic	LaplaceTransformOfPeriodicFunctions
Related topic	MinimalAndMaximalNumber
Defines	half-wave rectification
Defines	full-wave rectification

Let the positive number p be the antiperiod of the real function f and

$$f(t) \geqq 0 \quad \text{for} \;\; 0 < t < p.$$

Then the function f_1 defined by

$$f_1(t) \;:=\; \max\{f(t),\, 0\} \;=\; \begin{cases} f(t) & \text{for} \;\; f(t) > 0, \\ 0 & \text{for} \;\; f(t) \leqq 0 \end{cases}$$

is the *half-wave rectification* of f and the function f_2 defined by

$$f_2(t) \;:=\; |f(t)|$$

is the *full-wave rectification* of f. They are `http://planetmath.org/PeriodicFunctions`periodic, the former with `http://planetmath.org/PeriodicFunctions`period $2p$ and the latter with p.

The Laplace transforms are

$$\mathcal{L}\{f_1(t)\} \;=\; \frac{1}{1-e^{-ps}}F(s),$$

$$\mathcal{L}\{f_2(t)\} \;=\; \frac{1+e^{-ps}}{1-e^{-ps}}F(s).$$