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Problem 1.1

e. Is $f(n) \neq O(g(n))$ and $g(n) \neq O(f(n))$ sometimes, always, or never true?

I believe that it is sometimes true,

$f(n) = sin(n)$ and $g(n) = cos(n)$ shows truth to be possible. The book says that these sort of oscillating functions show that the intuitive analogies can only be taken so far. Meanwhile, $f(n) = g(n) = n$ shows falsehood to be possible.