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Problem 1.1

d. Is $f(n) = \Omega(g(n))$ and $f(n) = o(g(n))$ sometimes, always, or never true?

I believe that it is never true.

The little-oh notation expresses a loose upper-bound. The capital-omega notation expresses a tight lower-bound. In other words this being true would imply something along of the lines of: $f(n) < g(n)$ and $f(n) \geq g(n)$. This is obviously absurd.