

Linear Algebra: Proofs

1 Proof-A-Day, January 16

Claim: If n is a positive integer, then n is odd if and only if $5n+6$ is odd.

Proof. Suppose there is a positive integer n . Assume that the result of $5n+6$ is odd. $5n+6$ can be rewritten as $5(n+1)+1$. We know that any integer plus one results in a switched polarity (even becomes odd and odd becomes even), so the equation $5(n+1)$ must be even. Because five is an odd integer, the result of $n+1$ must be even because an odd integer times an even integer always results in an even integer. This means that n must be an odd integer.

Therefore, n is odd if and only if $5n+6$ is odd.

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