

If f is a linear map
 then f has a basis
 if f is diagonalizable
 then f has a basis
 if f is not diagonalizable
 then f does not have a basis
 if f is diagonalizable
 then f has a basis
 if f is not diagonalizable
 then f does not have a basis

$\text{Def } \text{diag}(f)$
 $\text{Def } \text{not diag}(f)$

f is diagonalizable \Leftrightarrow f is not diagonalizable \Leftrightarrow f is not diagonalizable \Leftrightarrow f is not diagonalizable \Leftrightarrow f is not diagonalizable	f has a basis f does not have a basis
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$\text{diag}(f)$
 $\text{not diag}(f)$
 f has a basis
 f does not have a basis
 f does not have a basis
 f does not have a basis

f is diagonalizable
 \Leftrightarrow f is not diagonalizable
 f has a basis
 f does not have a basis
 f is diagonalizable
 \Leftrightarrow f is not diagonalizable
 f has a basis
 f does not have a basis
 f is diagonalizable
 \Leftrightarrow f is not diagonalizable
 f has a basis
 f does not have a basis

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 \Leftrightarrow f is not diagonalizable
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 f does not have a basis
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