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Assignment 8

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Problem 6.2.15

http://calclab.math.tamu.edu/~b-young/6_2_15.pdf

How would you modify the Gram-Schmidt construction if one of the vectors in the original list turns out to be linearly dependent on the vectors preceding it?

Because the orthonormal vectors must all be linearly independent, the dependent vector will be useless in determining an orthonormal basis. Simply remove the vector that has been determined dependent from the set. If there are less vectors than dimensions in the space, that is, the span of the vectors is less than that of the space, then an arbitrary variable will appear through the process. Any choice of this variable will still result in an orthonormal basis.