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Math 362 Fourier Analysis

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Class Prep 7

Section 4.2

Key Concepts: In this section we express a given signal vector **v** in terms of orthogonal expansion vectors. We will compute the expansion coefficients of **v** using the vector version of the similarity coefficient formulas. We will also derive the discrete transform and inverse transform matrices, and see how they can be used to compute the discrete transforms of **v**.

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| --- | --- |
| Input Commands | Output |
| >> G=[1,0,1,0;0,1,0,1;1,0,-1,0;0,1,0,-1]  G =  1 0 1 0  0 1 0 1  1 0 -1 0  0 1 0 -1 |  |
| >> H=inv(G)  H =  0.5000 0 0.5000 0  0 0.5000 0 0.5000  0.5000 0 -0.5000 0  0 0.5000 0 -0.5000 |  |
| >> v=[2,10,2,-2]';  >> c=H\*v  c =  2  4  0  6 |  |
| >> v=G\*c  v =  2  10  2  -2 |  |