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Math 362 Fourier Analysis

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3.2 HW

Section 3.2

3.2.2

For the given functions on [0,1] adapt the box function MATLAB programs referenced in this section to do the following. Show MATLAB commands used.

1. Find the box transform c of .
2. Find the box function expansion of .
3. Plot the graph of together with .

|  |  |
| --- | --- |
| a.)  >> BoxLinearFcn(0,3)  coeffs =  1.2490 1.7490 2.2490 2.7490 | C = |
| b.)  >> BoxLinearFcn(0,3)  coeffs =  1.2490 1.7490 2.2490 2.7490 |  |
| >> BoxLinearFcn(0,3)  coeffs =  1.2490 1.7490 2.2490 2.7490 |  |

3.2.10

For the given functions on [0,1] adapt the Haar wavelet MATLAB programs referenced in this section to do the following. Show MATLAB commands used.

1. Find the wavelet transform c of .
2. Find the wavelet expansion of .
3. Plot the graph of together with .

|  |  |
| --- | --- |
| a.)  >> HaarPlot(0,5)  c =  1.9990  -0.5000  -0.2500  -0.2500 | C = |
| b.)  >> HaarPlot(0,5)  c =  1.9990  -0.5000  -0.2500  -0.2500 |  |
| c.)  >> HaarPlot(0,5)  c =  1.9990  -0.5000  -0.2500  -0.2500 |  |

3.2.18

For the given functions on [-1,1] adapt the Legendre polynomial MATLAB programs referenced in this section to do the following. Show MATLAB commands used.

1. Find the Legendre transform c of order n = 8 of
2. Graph together with several for selective values of k, 1

|  |  |
| --- | --- |
| a.)  >> LegendrePolyFcn(-2,2,8)  c =  -0.0050  5.6000  -0.0250  2.4000  -0.0450  0.0002  -0.0650  0.0005  -0.0850 | C = |
| b.)  >> LegendrePolyFcn(-2,2,1);  c =  -0.0050  5.6000  >> LegendrePolyFcn(-2,2,3);  c =  -0.0050  5.6000  -0.0250  2.4000  >> LegendrePolyFcn(-2,2,5);  c =  -0.0050  5.6000  -0.0250  2.4000  -0.0450  0.0002  >> LegendrePolyFcn(-2,2,7);  c =  -0.0050  5.6000  -0.0250  2.4000  -0.0450  0.0002  -0.0650  0.0005 |  |