# Answers to lecture problems – lectures 14…15

## Lecture 14

### Slide 1

Show that 

  
Then we have:  
  
This gives:  


### Slide 4

Adding a cosine wave of frequency two does not give a better approximation. It flattens the negative peak (good!) and sharpens the positive one (bad) if its coefficient is positive (as shown by the dotted pale blue lines in the graph below).

A close up of a logo

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If the cos(2t) term has a negative coefficient it flattens the positive peak (good!) and sharpens the negative one (bad).

## Lecture 15

### Slide 1

Fourier series for function:  


Function is odd to  and all  are zero.  
Coefficients as for example in lecture, but with sign change!



Function plus first few terms of Fourier series illustrated below:

A screenshot of a cell phone

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