Homework 1

1. Read Section 3.3.4 on compact differencing.

   (a) Verify the expression (3.52) for the phase speed of semi-discrete approximations to the 4th-order compact scheme (3.49), showing the key steps of your derivation.

   (b) Derive the expression for the phase speed of semi-discrete approximations to Lele's alternative 4th-order compact scheme (3.53).

Be sure to look at the plots of the curves you have derived, which are shown in Fig. 3.10. Note how they compare to the centered 6-point, 6th-order finite difference and to the 6th-order compact scheme (3.50).

2. Do problem (3) on p. 198.

Due Wednesday, April 13th