

Integrable Systems: Assessment 1

AMH2: Applied Mathematics Honours

Semester 2, 2017

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Due 9am Tuesday 15 August 2017

Submit scanned or typeset answers to TurnItIn on LMS Blackboard.
Bring your hardcopy to Lecture at 2pm.

1. Find the travelling-wave solutions, in the form $u(x, t) = f(x - ct)$, of the modified KdV equation:

$$u_t + 3(1 + u)u_x + u_{xxx} = 0,$$

such that $u \rightarrow 0$, $u_x \rightarrow 0$, $u_{xx} \rightarrow 0$ when $|x| \rightarrow \infty$.

How is the height of this wave related to its speed?