

Integrable Systems: Assessment 5

AMH2: Applied Mathematics Honours

Semester 2, 2017

Lecturer: *Nalini Joshi* (Rm 629), *Milena Radnovic* (Rm 624), *Yang Shi* (Rm 633)

Due 9am Tuesday 12 September 2017

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

1. Solve the Gel'fand-Levitan-Marchenko equation for the case where the reflection coefficient is given by

$$R(\zeta) = -\frac{b_0}{b_0 + i\zeta},$$

for $b_0 \neq 0$. [Hint: the Fourier transform $\widehat{R}(z)$ of $R(\zeta)$ is $-i\pi b_0 \exp(-b_0 z) \operatorname{sgn}(z)$ and the integral equation can be tackled by separation of variables.]