

Math 724: Problem Set 1

Due on 9.7.06

1. Is the ideal $(3x, 7)$ in $\mathbb{Z}[x]$ maximal? Prime? Principal? Prove your answer.
2. Let M be an R -module, and $I = \text{ann } M$. Show that I is an ideal, and that M can be made into a well-defined R/I -module under the operation $(r + I)m = rm$. Note that you have to prove this R/I action is well-defined (among other things). If I is maximal, what does that imply about M ?