Homework 7

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1 Problem 1

1.1 Part 1

In order for IS to be a submodule of A, we need to show the following implication:

$$x \in IS,\ a \in A \implies xa \in IS.$$

Suppose $x \in IS$. Then by definition, $x = \sum_{i=1}^{n} r_i a_i$ for some $r_i \in R, a_i \in A$.

But then

$$\begin{aligned} xa &= \left(\sum_{i=1}^{n} r_i a_i\right) a \\ &= \sum_{i=1}^{n} r_i a_i a \end{aligned}$$

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