M341 (56140), Homework #8

Due: 11:00am, Thursday, Oct. 25

Instructions: Questions are from the book "Elementary Linear Algebra, 4th ed." by Andrilli & Hecker. Please show all your work, not only your final answer, to receive credit. Keep answers organized in the same order the problems have been assigned.

Vector spaces (4.1)

p. 213-215, #3, 5, 7, 12, 13, 18

Subspaces (4.2)

p. 223-227, #1(a,c,d), 2(f,g,h), 6, 7, 11, 15, 18

In addition:

A) Let $\mathcal{A} = \mathbb{R}$, with the operations $\oplus$ and $\odot$ given by $\boldsymbol{x} \oplus \boldsymbol{y} = \left(x^5 + y^5\right)^{1/5}$ and $a \odot \boldsymbol{x} = a\boldsymbol{x}$. Is $\mathcal{A}$ a vector space? If it is, prove it. If not, how would you modify the definition of scalar multiplication so that $\mathcal{A}$ becomes a vector space?