Math 4326/5322   **LINEAR ALGEBRA**   Spring 2019
Dr. Duval   **Main Exercises**
due 2pm, Thursday, February 7

1. Find two distinct square roots of $1 - i$.

2. Let $a, b, c, d \in \mathbf{F}$, and let $x \in \mathbf{F}^n$. Prove that

$$(ab + cd)x = a(bx) + c(dx).$$

3. Let $a, b \in \mathbf{F}$. Let V be a vector space, and let $v \in V$. Prove that if $av = bv$, then $a = b$ or $v = 0$.

4. (Graduate students only) Explain why there does not exist $\lambda \in \mathbf{C}$ such that

$$\lambda(1 + 2i, 3 - 4i, 5 + 6i) = (-4 + 7i, 18 + i, 8 + 27i)$$