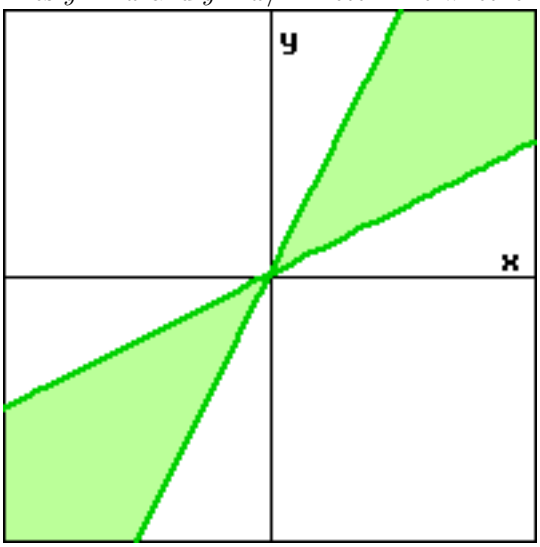
Dawson College: Winter 2019: Linear Algebra (SCIENCE): 201-NYC-05-S6: **Quiz 13** name: _____

No books, watches, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

Question 1.[1] *(5 marks)* Let $V = \mathbb{R}^2$ and let H be the subset of V of all points in the first and third quadrants that lie between the lines $y = 2x$ and $y = x/2$. Determine whether H is closed under vector addition and scalar multiplication.



Question 2. *(5 marks)* Prove: If a nonempty subset W of a vector space V is closed under addition and scalar multiplication, under the inherited operations then W is a vector space.

Question 3. *(2 marks)* $\mathbb{R}^3$ has infinitely many subspaces. Do every non-trivial space have infinitely many subspaces?

Question 4. *(2 marks)* Is $\mathbb{R}^2$ a subspace of $\mathbb{R}^3$?

Question 5. *(2 marks)* If A is a subspace of a vector space V, is its complement $A^c = \{\vec{x} \in V \mid \vec{x} \notin A\}$ a subspace of V?

[1] From WeBWorK.