Concept check - Week 1

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Concept check Questions

1. Describe a subspace S of each vector space V and then a subspace SS of S:
   - $V_1 = all\ combinations\ of\ (1,1,0,0), (1,0,1,0)\ and\ (1,1,1,1)$
   - $V_2 = all\ symmetric\ 2\ by\ 2\ matrices$
   - $V_3 = all\ solutions\ to\ the\ equation \frac{d^4y}{dx^4} = 0$
2. Start with vectors $v_1 = (1,2,0)\ and\ v_2 = (2,3,0)$
   - Are $v_1\ and\ v_2$ linearly independent?
   - Are they a basis for any space?
   - What space V do they span?
   - What is the dimension of V?
   - Describe all vectors v_3 such that v_1, v_2, v_3 completes a basis of $\mathbb{R}^3$
3. Let w_1, w_2, w_3 be independent vectors. What can you say about the independence of $w_1 - w_2$, $w_1 - w_3, w_2 - w_3$? What about $w_1 + w_2, w_1 + w_3, w_2 + w_3$?