1) If $L: V \to W$ is a linear transformation,

a) and the image of L contains a basis for W, then L is onto

b) If $\{v_i\}_{i=1}^{k}$ is a basis for V, and the set $\{L(v_i)\}_{i=1}^{k}$ is linearly independent, show L is 1-1

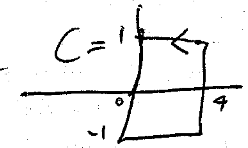
2) Let $L: \mathbb{R}^4 \to \mathbb{R}^4$ be the linear transformation defined by $L(e_i) = e_1 + e_i$.
Show L is an isomorphism, and compute the matrix for L with respect to the usual basis of $\mathbb{R}^4$.

3) Use the formula

$$\left(\sum_{n=0}^{\infty} a_n z^n\right)\left(\sum_{n=0}^{\infty} b_n z^n\right) = \left(\sum_{n=0}^{\infty}\left(\sum_{k=0}^{n} a_k b_{n-k}\right) z^n\right)$$

to compute the first 4 terms of the Taylor series for $\sin z \cos z$.

4) Find the solutions of $z^6 = i$, and of $z^5 = 16\sqrt{2}(1+i)$
Draw them!

5) Compute $\oint_C \frac{z}{(z-2)(z+2)} dz$ where $C =$ 

6) State Cauchy's theorem. Explain how Cauchy's theorem lets you prove the residue theorem for functions with isolated singularities.

7) Prove $\oint_C f(z)dz = 2\pi i b_1$ when C is a small contour around z_0, and b_1 is the coefficient of z^{-1} in a Laurent series at z_0.