

Math 132 - HW 12  
due February 27

February 20, 2015

1. Let  $V$  be a finite-dimensional inner product space and  $T$  be a linear operator on  $V$ . Prove that the image of  $T^*$  is equal to  $\text{Ker}(T)^\perp$ , the orthogonal complement to the kernel of  $T$ .
2. Suppose you are doing an experiment and come out with the following four data points:  $(-3, 9)$ ,  $(-2, 6)$ ,  $(0, 2)$ , and  $(1, 1)$ .
  - (a) Find the least squares line - i.e. the line that best fits the data in that it minimizes the sum of the squares of the errors.
  - (b) Find the parabola that best fits the data.