M561 Problem Set Number 6

1. Problem 15.1 b)
2. Problem 17.1 a), b)
3. Problem 17.2
4. Given $\|E\|_1 \leq \|B\|_1\|A\|_1 O(\epsilon_{machine})$ show $\|E\|_2 \leq \|B\|_2\|A\|_2 O(\epsilon_{machine})$.
5. Consider the statement

$$\frac{\|\tilde{f}(x) - f(x)\|}{\|f(x)\|} = O(\epsilon_{machine})$$

Does this statement mean that the relative error of an algorithm is always "small"? Compare the statement

$$\frac{\|\tilde{f}(x) - f(x)\|}{\|f(x)\|} = O(\kappa(x)\epsilon_{machine})$$

Again, discuss the size of the relative error? (Is it always small?).