

## 18.700. Problem Set 1

**Due date:** September 16 (Friday) in lecture or in my office before noon on due date. Late homeworks will be accepted only with a medical note or for some other MIT approved reason. You may work with others, but the final write-up should be entirely your own and based on your own understanding.

Each problem is worth 5 points.

**Problem 1:** 0.2.2.(c)

**Problem 2:** Are the following systems of equations *row equivalent*?

$$\begin{cases} X + Y = 0 \\ 2X - Y = 0 \end{cases} \quad \begin{cases} 3X - Y = 0 \\ X + 2Y = 0 \end{cases}$$

**Problem 3:** 0.2.8.

**Problem 4:** Prove that any consistent system of  $m$  linear equations in  $n$  variables, with  $m < n$ , has infinitely many solutions. Write your argument clearly.

**Problem 5:** 0.3.6.

**Problem 6:** 0.3.10.

**Problem 7:** 0.4.2.(d)

The following problems are recommended for additional practice. They should *not* be turned in with the homework and they will not count towards the homework score. Section 0.2: 1-2 (choose some examples), 6, 10, 11, 14. Section 0.3: 1 (choose some examples), 3, 5, 7, 11, 13.