

EXAMPLES OF SECTION 1.1

Example 1. For what value(s) of k , is the following system of linear equations

$$\begin{cases} x + 2y = k \\ 2x + 4y = 5 \end{cases}$$

consistent? inconsistent?

Solution. We multiply the first equation by -2 and add it to the second equation. This yields

$$0 = 5 - 2k.$$

This is possible if and only if $k = 5/2$. So when $k = 5/2$, this system is consistent. Otherwise, it is inconsistent. ◀

Remark 2. When $k = 5/2$, the second equation is just 2 times the first equation. So they represent the same line in the $x - y$ plane. For any other value of k , the line represented by the first equation is parallel to the line represented by the second equation. Thus there is no intersection.