#Matt's vector code
xVector := Vector[row](2);

$$[\,0 \quad 0\,] \tag{1}$$

xVector := [1, 1];

$$[1, 1] \tag{2}$$

yVector := [1, 2];

$$[1, 2] \tag{3}$$

firstxy := L·xVector + M·yVector;

$$L\,[1, 1] + M\,[1, 2] \tag{4}$$

solve({L + M = x, L + 2·M = y}, {L, M});

$$\{L = 2\,x - y, M = -x + y\} \tag{5}$$

#Maple solved a system with two equations and two unknowns
 # the rest of the question does not make sense to me
 # hope this helps.