

**WORKSHEET 10/11/23**  
**MATH 2331, FALL 2023**

In these problems,  $\vec{v}_1 = (1, 1, 1)$ ,  $\vec{v}_2 = (1, 2, 3)$ , and  $V = \text{Span}(\vec{v}_1, \vec{v}_2)$ .

- (1) Are  $\vec{v}_1$  and  $\vec{v}_2$  linearly independent? Don't work too hard!
- (2) Find a basis for  $V$ . Don't work too hard!
- (3) Is the vector  $\vec{x} = (5, 7, 9)$  contained in  $V$ ?
- (4) If your answer to #3 was "yes," write  $\vec{x}$  as a linear combination of the basis vectors you found in #2.
- (5) How many different answers to #4 could there be?
- (6) What is the dimension of  $V$ ?
- (7) Describe the subspace  $V$  geometrically.
- (8) Draw a schematic picture of  $V$ , including your basis vectors from #2.
- (9) Add the vector  $\vec{x}$  to your picture from #8.