**Math 220  
1.6: Applications of Linear Systems  
1.7: Linear Independence   
Questions for flipped class**

**Key terms**:

Linearly independent

Linearly dependent

What is the connection between linear dependence/independence and the homogeneous equation?

Vocabulary warning: The phrase “free variables” only makes sense in the context of equations.

* That is, we might talk about the free variables in Ax=b.
* If we just have A, then we might talk about columns without a pivot.
* If we just had a bunch of vectors, then we might talk about the columns without a pivot in the associated matrix (or associated augmented matrix).

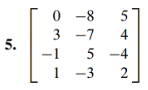
(1.6-7.4)



**Short**

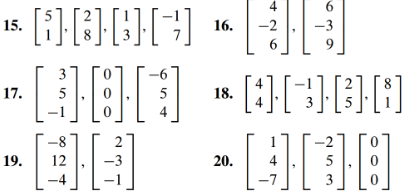
(1.6-7.1) (using a Texan Friend)





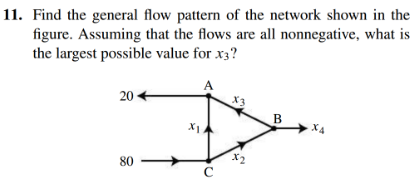
(1.6-7.2) (by inspection = no Texan Friends)





**Tall**

(1.6-7.3 application from section 1.6)



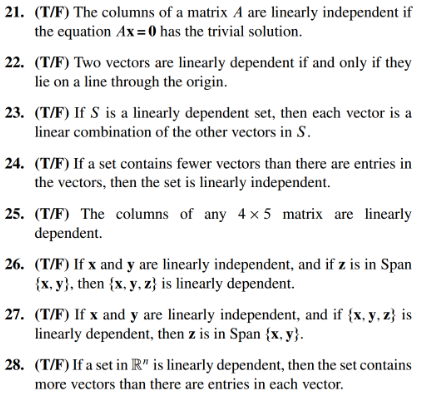
**Grande**

(1.6-7.5)

True or false. If it is false, provide a counter example (a specific example that shows that the statement isn’t always true).



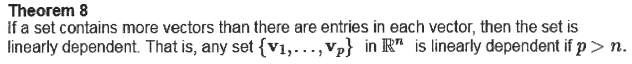
(1.6-7.6)



**Venti**

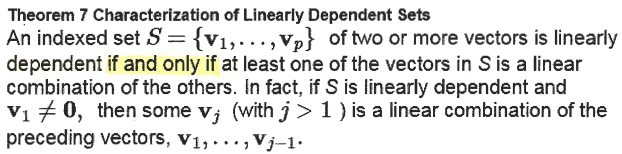
(1.6-7.7 theory question)

Prove Theorem 8 (if-then proof)



(1.6-7.8 theory question)

Prove Theorem 8 (if and only if proof)



(1.6-7.1 solution)

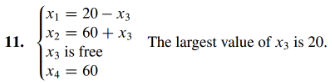


(1.6-7.2 solution)

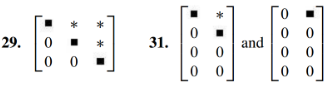


**16.** Lin dep. **18**. Lin. Dep. **20.** Lin dep.

(1.6-7.3 solution)



(1.6-7.4 solution)

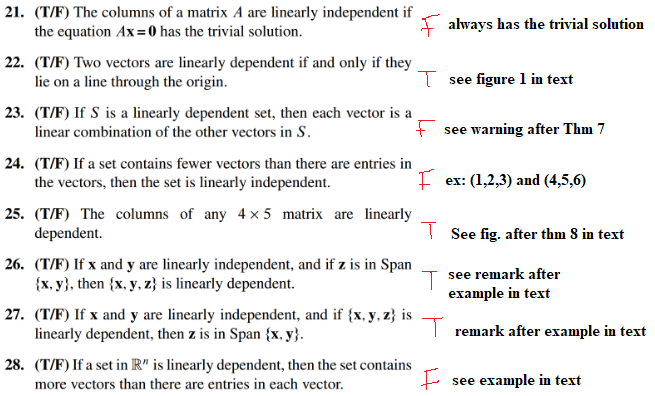


(1.6-7.5 solution)

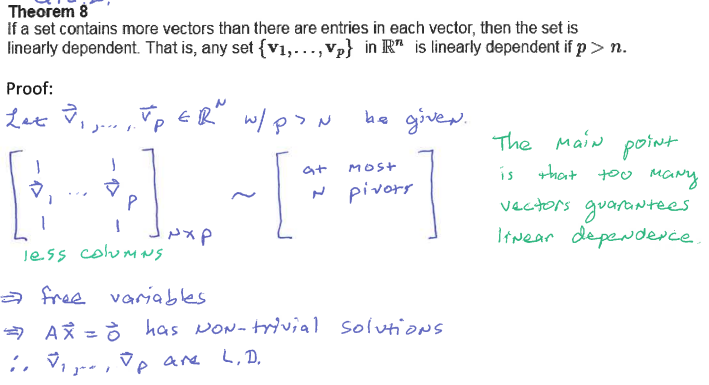


False, for example the vectors could be e1, e2, e3, and e1. This is a linearly dependent set.

(1.6-7.6 solution)



(1.6-7.7 proof)



(1.6-7.8 proof)

