Part I (due Monday, January 29 at the beginning of class)

Read Subsection 2.2.4: Matrix-matrix Products, stopping when you get to Activity 2.2.5 (a very short selection from the book). Then read Definition 1, Definition 2, Example 5, Definition 3, and Example 8 on the blue Matrices handout from class Friday.

Reading Question(s)

1. What is the transpose of the identity matrix?
2. What is the trace of the identity matrix?

Note: you can ask questions about things we've done in class as part of your part (b) for Part I as well as about the reading.

Part II (prepare for Wednesday, January 31)

There will be a WeBWorK assignment posted by Friday night.

Part III: Homework (due Wednesday, January 31 at the beginning of class)

1. True or false? If true, prove; if false, give an explained counterexample.
   (a) The zero vector in $\mathbb{R}^n$ is a scalar multiple of any other vector in $\mathbb{R}^n$.
   (b) The zero vector cannot be a linear combination of two nonzero vectors.
   (c) Given two vectors $\vec{v}$ and $\vec{w}$ in $\mathbb{R}^n$, the vector $\frac{1}{2}\vec{v}$ is a linear combination of $\vec{v}$ and $\vec{w}$.
   (d) Given any two nonzero vectors $\vec{v}$ and $\vec{w}$ in $\mathbb{R}^2$, we can obtain any vector in $\mathbb{R}^2$ as a linear combination of $\vec{v}$ and $\vec{w}$.
   (e) Given any two distinct vectors $\vec{v}$ and $\vec{w}$ in $\mathbb{R}^2$, we can obtain any vector in $\mathbb{R}^2$ as a linear combination of $\vec{v}$ and $\vec{w}$.
   (f) If $\vec{u}$ is in the span of $\vec{v}$ and $\vec{w}$, then $2\vec{u}$ is also in the span of $\vec{v}$ and $\vec{w}$.

Running list of vocabulary words that could be a quiz word

- linear equation
- system of linear equations
- linear combination of a set of vectors
- span of a set of vectors

- linearly independent
- linearly dependent
- reduced row echelon form
- pivot
- homogeneous system
- free variable
- row equivalent
- consistent system
- inconsistent system