

(10pts) NAME (printed neatly): _____

(5pts) Section Number (circle correct section): 503 (10:20am) 521 (11:30am) 523 (1:50pm)

Quiz Grade: _____

1. (10pts) If $A = \begin{bmatrix} 2 & n \\ 0 & v \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 5 \\ p & 0 \end{bmatrix}$, find AB .

$$AB = \begin{bmatrix} 2 & n \\ 0 & v \end{bmatrix} \begin{bmatrix} 1 & 5 \\ p & 0 \end{bmatrix} = \begin{bmatrix} 2 \cdot 1 + n \cdot p & 2 \cdot 5 + n \cdot 0 \\ 0 \cdot 1 + v \cdot p & 0 \cdot 5 + v \cdot 0 \end{bmatrix} = \begin{bmatrix} 2 + np & 10 \\ vp & 0 \end{bmatrix}$$

2. (15pts) Four couples attend a theater show and are seated in a row of eight seats. How many different seating arrangements are possible if couples are seated together and Susan must sit on one of the ends?

$$2 * 1 * 6 * 1 * 4 * 1 * 2 * 1 = 96$$

[Note: There are two ends for Susan to sit at, and Susan's partner must sit next to her.]

3. (15pts) The providence of Maroon Isle has license plates that consist of 2 different letters, followed by 3 numbers. If the letters are case-sensitive, how many different license plates are possible?

$$52 * 51 * 10 * 10 * 10 = 2,652,000$$

4. (15pts) How many different ways can the letters of the word *Abracadabra* be permuted?

$$\frac{11!}{2!2!4!} = 415,800$$

[Note: A is different from a.]

5. Your music collection consists of 4 different country, 5 different soft rock, and 2 different dance CDs.

- a. (10pts) How many ways is it possible to place all CDs lined up on a shelf if the same type are grouped together?

$$3! 4! 5! 2! = 6 * 24 * 120 * 2 = 34,560$$

[Note: (order types)(order country)(order soft rock)(order dance)]

- b. (10pts) If you grab 3 of these CDs, how many ways can you get 2 country or 1 soft rock CDs?

$$\begin{array}{ccccccc} 2C & 1C^c & & 1R & 2R^c & & 2C & 1R \\ C(4, 2) & C(7, 1) & + & C(5, 1) & C(6, 2) & - & C(4, 2) & C(5, 1) = \\ 6 & * & 7 & + & 5 & * & 15 & - & 6 & * & 5 & = & 87 \end{array}$$

6. (10pts) In the Venn Diagram, shade the set that represents $L^c \cup (N \cap M)$.

