

FINAL REVIEW #6: MATRICES AND VENN DIAGRAMMS
FINAL EXAM: 5/31/18 & 6/1/18

TOPIC #1: MATRICES

1) Identify the resulting matrix, if possible, when multiplying the following matrices (**DO NOT ACTUALLY MULTIPLY!**)

<p>a)</p> $\begin{bmatrix} -1 & 5 \\ 7 & 0 \end{bmatrix} \begin{bmatrix} 6 \\ 2 \end{bmatrix}$ <p>2×2 2×1</p> <p>RESULT = (2×1)</p>	<p>b)</p> $\begin{bmatrix} -1 \\ 7 \end{bmatrix} \begin{bmatrix} 0 & 2 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ <p>2×1 3×2</p> <p>CANNOT MULTIPLY!</p>	<p>c)</p> $\begin{bmatrix} 5 & 2 \\ 7 & 6 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} 1 & 4 & 0 \\ 2 & -1 & 2 \end{bmatrix}$ <p>3×2 2×3</p> <p>RESULT = 3×3</p>	<p>d)</p> $\begin{bmatrix} 5 & 2 \\ 7 & 6 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} 9 & 12 \\ 8 & -7 \\ -1 & 0 \end{bmatrix}$ <p>3×2 3×2</p> <p>CANNOT MULTIPLY!</p>
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2) Find the determinant of the following:

$\begin{vmatrix} 3 & 5 \\ 2 & -6 \end{vmatrix}$ <p>$ad - bc$ $(3)(-6) - (2)(5)$ $-18 - 10$ -28</p>	<p>$2^{nd} \rightarrow$ matrix $\rightarrow \begin{pmatrix} 16 & -1 & 0 \\ -4 & -12 & 1 \\ 6 & 7 & 8 \end{pmatrix}$ math \rightarrow det()</p> <p>-1686</p>
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3) Answer the following based on the matrices below: *use 2nd matrix!*

$$A = \begin{bmatrix} 9 & 2 & -5 \\ 4 & -8 & 0 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 5 & 8 \\ 4 & -2 & 11 \end{bmatrix}$$

<p>a) $A + B$</p> $\begin{bmatrix} 8 & 7 & 3 \\ 8 & -10 & 11 \end{bmatrix}$	<p>b) $2A$</p> $\begin{bmatrix} 18 & 4 & -10 \\ 8 & -16 & 0 \end{bmatrix}$	<p>c) $3A - B$</p> $\begin{bmatrix} 28 & 1 & -23 \\ 8 & -22 & -11 \end{bmatrix}$
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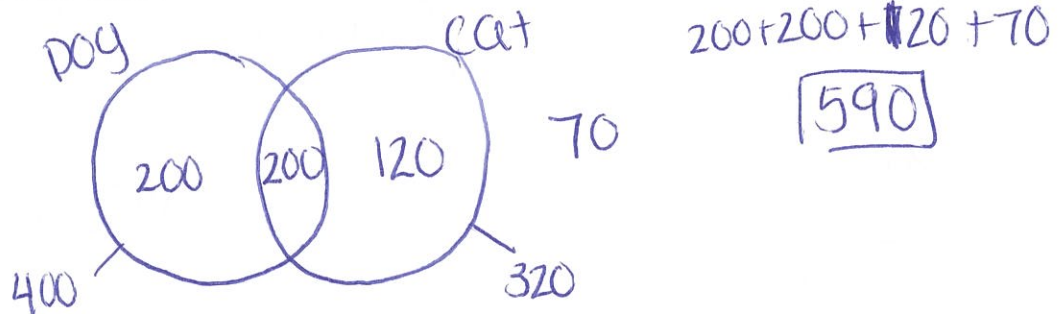
4) Answer the following based on the matrices below:

$$A = \begin{bmatrix} 4 & 3 \\ 6 & -1 \end{bmatrix} \quad B = \begin{bmatrix} -3 & 7 \\ 5 & -6 \end{bmatrix}$$

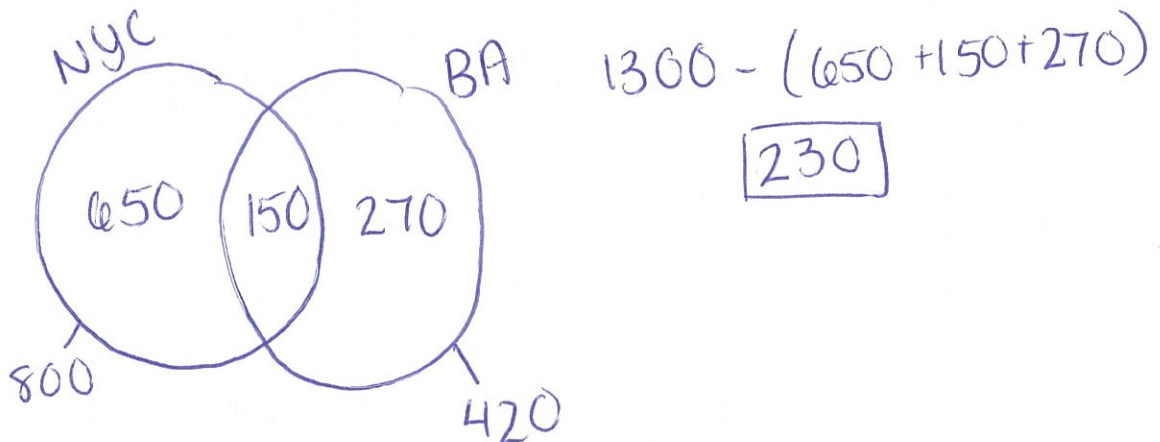
<p>a) $A \times B$</p> $\begin{bmatrix} 3 & 10 \\ -23 & 48 \end{bmatrix}$	<p>b) $3A \times 3B$</p> $\begin{bmatrix} 27 & 90 \\ -207 & 432 \end{bmatrix}$	<p>c) $4A - 3B$</p> $\begin{bmatrix} 25 & -9 \\ 9 & 14 \end{bmatrix}$
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TOPIC #2: VENN DIAGRAMS

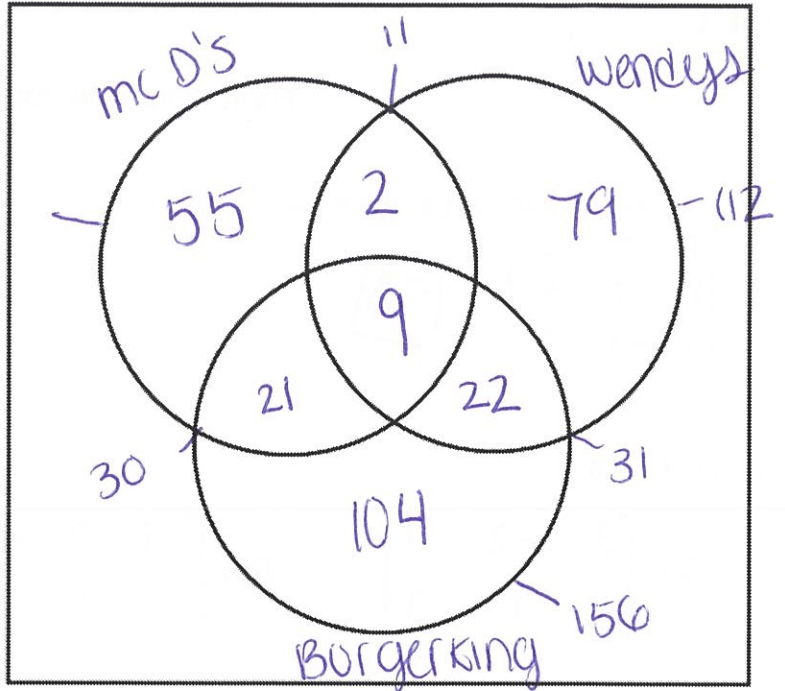
5) 400 people have a dog, 200 have a dog and a cat, 320 have a cat, and 70 do not have either. How many people were surveyed?



6) 800 people like New York City, 150 liked both New York City and Boston, 420 like Boston, and there were 1300 people surveyed, how many people did not like either New York City or Boston?



- 7) 55 only like McDonald's
- ✓ 112 like Wendy's
- ✓ 156 like Burger King
- ✓ 11 like McDonald's and Wendy's
- ✓ 30 like McDonald's and Burger King
- ✓ 31 like Wendy's and Burger King
- ✓ 9 like all 3

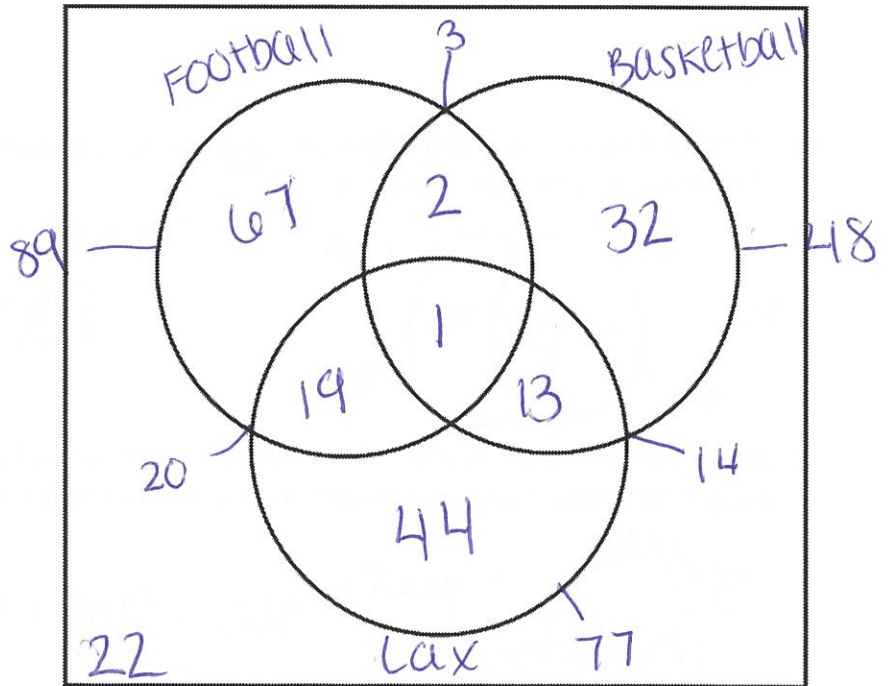


How many people were surveyed?
 Add everything in the circles!
 $55 + 2 + 79 + 21 + 9 + 22 + 104$

292

assuming no one liked none.

- 8) 200 people were surveyed
- ✓ 89 play football
- ✓ 48 play basketball
- ✓ 77 play lacrosse
- ✓ 20 play football and lacrosse
- ✓ 14 play lacrosse and basketball
- ✓ 3 play football and basketball
- ✓ 1 played all 3



- a) How many play football only? **67**
- b) How many play basketball only? **32**
- c) How many play lacrosse only? **44**

d) How many play none?

$200 - 178 = \mathbf{22}$

↓
sum of circles

FINAL REVIEW #6: EXIT TICKET

1) Find the determinant of the following matrix

$$\begin{vmatrix} 1 & 6 & -2 \\ 4 & 7 & -5 \\ 3 & -3 & 2 \end{vmatrix} \quad \boxed{73}$$

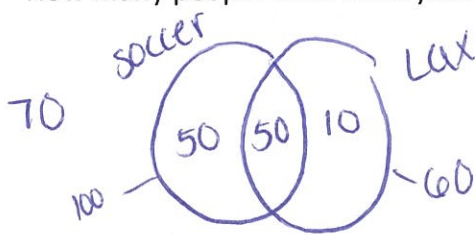
2) Find $A + B$

$$A = \begin{bmatrix} 3 & -2 & -1 \\ 1 & 0 & 3 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 2 & -8 \\ -4 & 1 & -1 \end{bmatrix} = \begin{bmatrix} 2 & 0 & -9 \\ -3 & 1 & 2 \end{bmatrix}$$

3) Find $A \times B$

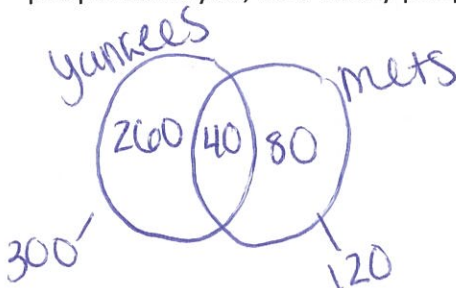
$$A = \begin{bmatrix} 0 & -3 \\ 2 & -4 \end{bmatrix} \quad B = \begin{bmatrix} -3 & 9 \\ 2 & -2 \end{bmatrix} = \begin{bmatrix} -6 & 6 \\ -14 & 26 \end{bmatrix}$$

4) 100 people play soccer, 50 play soccer and lacrosse, 60 play ^{Lax} ~~soccer~~, and 70 don't play either sport. How many people were surveyed?



$$70 + 50 + 50 + 10 = \boxed{180}$$

5) 300 people like the Yankees, 40 like both the Yankees and Mets, 120 like the Mets, and there were 500 people surveyed, how many people did not like either the Yankees or Mets?



$$500 - (260 + 40 + 80) = \boxed{120}$$