Section 4 – 3B: **The Logical Connectors AND or OR**

The use of row and column headings combined with the logical connectors **AND or OR** can be used to describe a cell or a group of cells.

The Logical Connector AND

The **intersection** of a **row AND column** is a **single cell** . **That single cell represents the number of players that are have the attribute of the row heading AND the the attribute of the column heading.**

Example 1

The number in the **single cell** found at the **intersection** of the **Varsity row AND Guard column** 3 **represents the number of players that are on the Varsity Team AND play Guard.**

	Guards	Forwards	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

Example 2

The number in the **single cell** at the **intersection** of the Jr. Varsity **row AND Forward column** 8 **represents the number of players that are on the Jr. Varsity Team AND play Forward.**

	Guards	Forwards	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

Example 3:

The number in the **single cell** found at the **intersection** of the **Varsity row AND Center column** 2 **represents the number of players that are on the Varsity Team AND play Center.**

	Guards	Forwards	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

The use of the Logical Connector OR

We want to describe the players whose frequencies are found in **ALL** of the blue cells below.

	Guards	Forwards	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

We cannot use **just** the **Varsity** row heading to describe **all the cells** because the 6 cell is not in the varsity row. We cannot use **just** the **Guards** column heading because the 5 and 2 cells are not in the Guard column.

We can say that the all the blue cells represent **either a Varsity Player OR a Guard**

To be a **Varsity Player OR a Guard**
means that you are
a **Varsity Player OR a Guard or BOTH**

A second way to state this is

The cells that represent being a **Varsity Player OR a Guard**
are **all the cells** in the **Varsity Row** row **COMBINED** with all the cells in the **Guard Column**

Note: The inclusion of the 3 cell in the cells that represent **Varsity Players OR Guard** bothers some students. They say that this cell represents players who are on the varsity team **and** a guard. If you read the definition above for **OR** you will see that the 3 cell should be included as it is in **both groups.**

Describe the players whose frequencies are found in **ALL** of the blue cells below.

Example 1:

	Guards	**Forwards**	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

The entire row of Jr. Varsity and the entire column of Forward are blue so the answer is Jr. Varsity Team OR Forward but you could also use **Forward OR Jr. Varsity Team**

Example 2:

	Guards	Forwards	**Centers**	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

The entire column of Guard and the entire column of Center are blue so the answer is Guard OR Center but you could also use **Center OR Guard**

Example 3:

	Guards	Forwards	**Centers**	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Total	9	13	3	25

The entire row of Varsity and the entire column of Center are blue so the answer is Varsity Team OR Center you could also use **Center OR Varsity Team**

Example 4:

	Guards	Forwards	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Freshman Team	4	7	9	20
Total	13	20	12	45

The entire row of Varsity the entire row of Freshman are blue so the answer is

Varsity Team OR Freshman Team but you could also use **Varsity Team OR Freshman Team**

Reading Frequencies from a Contingency Table

A local high school has a Freshman, Junior Varsity and Varsity basketball team. Each team has Guards, Forwards and Centers. Each player plays on only one team and at only one position. The coach lists the teams and the number of players at each position for each of the 45 players.

Sample Space:

	Guards	Forwards	Centers	Total
Varsity Team	3	5	2	10
Jr. Varsity Team	6	8	1	15
Freshman Team	4	7	9	20
Total	13	20	12	45

State the total number of players for each of the following descriptions.

1. Guards = ___
2. Centers = ____
3. Varsity = ____
4. Freshman = ____

5. Freshman **and** Center = _____
6. Guard **and** Varsity = _____
7. Forward **and** Jr. Varsity = _____
8. Freshman **and** Varsity = _____
9. Varsity **and** Forward = _____
10. Guard **and** Forward = _____

11. Forward **or** Jr. Varsity = _____
12. Freshman **or** Varsity = _____
13. Freshman **or** Center = _____
14. Guards **or** Varsity = _____
15. Varsity **or** Jr. Varsity = _____
16. Forward **or** Center = _____

Answers:

1. 13	2. 12	3. 10	4. 20	5. 9	6. 3	7. 8
8. 0	9. 5	10. 0	11. 27	12. 30	13. 23	14. 20
15. 25	16. 32					

