

Please reflect and turn in!

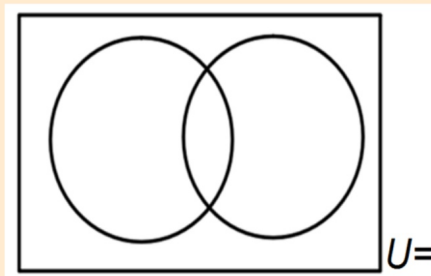
	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>5-21</u> Topic: <u>Venn Diagrams Day 1</u>	0 1 2	
Tuesday Date: <u>5-22</u> Topic: <u>Real-life Venn Diagrams</u>	0 1 2	
Wednesday Date: _____ Topic: _____	0 1 2	
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up:

GET:

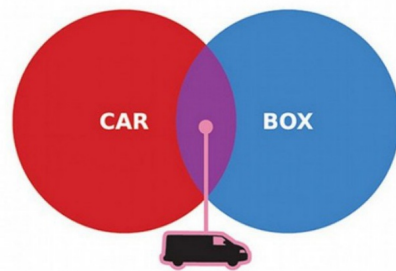
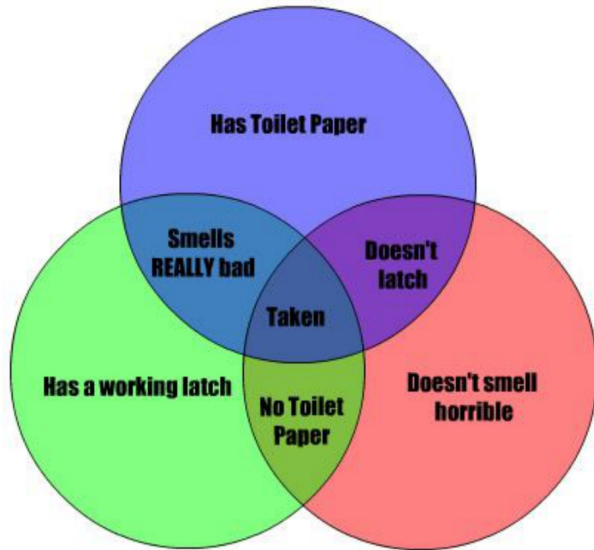
- Whiteboard marker
- Whiteboard
- Eraser

Do: Draw 2 set Venn Diagram



Jokes :)

The School Bathroom Paradox



VAN DIAGRAM

9gag.com

Class Plan

1) Warm-up

2) Real-life Venn Diagrams

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PROBABILITIES FROM VENN DIAGRAM

In **Chapter 3** we studied **Venn diagrams**. We saw that they consist of a rectangle which represents the universal set, and circles within it which represent subsets. In probability questions, the circles in a Venn diagram are used to represent particular events.

3) Choose partners for partner assessment.

4) Practice

Numbers in a Bag (1 to 25)

The numbers from 1 to 25 are placed in a bag, and one number is selected at random. Let A represent multiples of 3, and B represent multiples of 4.



Numbers in a Bag (1 to 25)

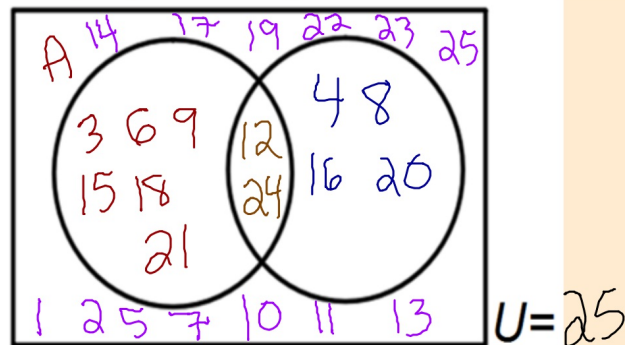
The numbers from 1 to 25 are placed in a bag, and one number is selected at random. Let A represent multiples of 3, and B represent multiples of 4.

Set A (x3)

3, 6, 9, 12, 15, 18, 21,
24

Set B (x4)

4, 8, 12, 16, 20, 24



Numbers in a Bag (1 to 25)

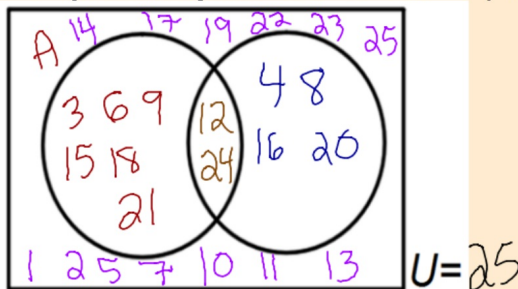
Probability Questions: Challenge yourself to use the set notation for each question.

$$P(\text{Multiple of 3}) = \underline{\hspace{2cm}}$$

$$P(\text{Multiple of 3 AND 4}) = \underline{\hspace{2cm}}$$

$$P(\text{Multiple of 4, but not 3}) = \underline{\hspace{2cm}}$$

$$P(\text{Multiple of 3 or 4, not both}) = \underline{\hspace{2cm}}$$



Numbers in a Bag (1 to 25)

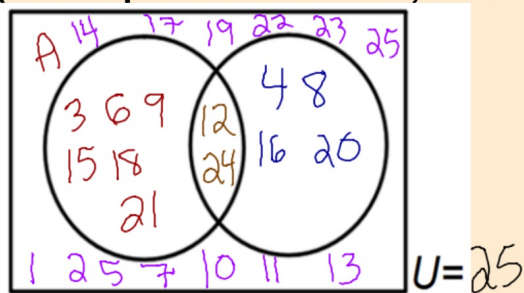
Probability Questions: Challenge yourself to use the set notation for each question.

$$P(\text{Multiple of 3}) = \frac{6}{25} \quad P(A)$$

$$P(\text{Multiple of 3 AND 4}) = \frac{2}{25} \quad P(A \cap B)$$

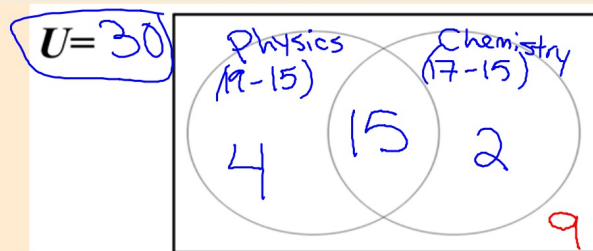
$$P(\text{Multiple of 4, but not 3}) = \frac{4}{25} \quad P(A' \cap B)$$

$$P(\text{Multiple of 3 or 4, not both}) = \frac{10}{25} = \frac{2}{5} \quad P(A \cap B)'$$



Physics & Chemistry

In a class of 30 students, 19 study Physics, 17 study Chemistry, and 15 study both of these subjects. Display this information on a Venn diagram and hence determine the probability that a randomly selected class member studies:



a both subjects $\frac{15}{30}$

b at least one of the subjects $\frac{21}{30}$

c Physics but not Chemistry $\frac{4}{30}$

d exactly one of the subjects $\frac{16}{30}$

e neither subject $\frac{9}{30}$

f Chemistry if it is known that the student studies Physics.

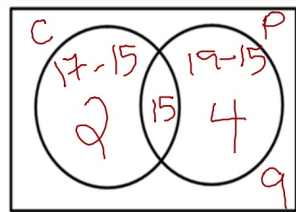
$$\frac{15}{19}$$

Physics & Chemistry

"Given"

In a class of 30 students, 19 study Physics, 17 study Chemistry, and 15 study both of these subjects. Display this information on a Venn diagram and hence determine the probability that a randomly selected class member studies:

$$(P \cup C)' = 9$$



$$\begin{aligned} C &= 17 \\ P &= 19 \\ C \cap P &= 15 \\ C \cup P &= 21 \end{aligned}$$

$$U = 30 \approx C \cup P'$$

a both subjects

$$P(C \cap P) = \frac{15}{30} = 50\%$$

b at least one of the subjects

$$P(C \cup P) = \frac{21}{30} = 70\%$$

c Physics but not Chemistry

$$P(P \cap C') = \frac{4}{30} = \frac{2}{15}$$

d exactly one of the subjects

$$P[(C \cap P') \cup (P \cap C')] = \frac{6}{30} = \frac{1}{5}$$

e neither subject

$$P((P \cup C)') = \frac{9}{30} = \frac{3}{10}$$

f Chemistry if it is known that the student studies Physics.

$$P(C | P) = \frac{15}{19}$$

Badminton

3) A badminton club has 31 playing members. 28 play singles and 16 play doubles.

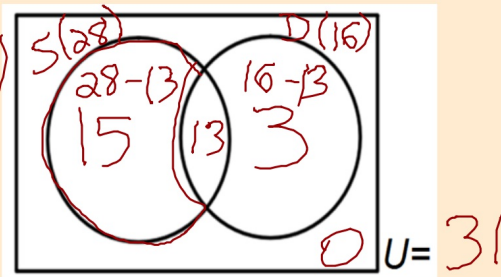
i) Create a Venn diagram.

ii) How many play both singles and doubles? 13

Doubles and not singles

iii) What's the probability that a player randomly selected has played doubles, but no singles?

$$\text{iii) } P(\text{DNS}) = \frac{3}{31}$$



$$44 - 31 = 13$$

$$28 + 16 = 44$$

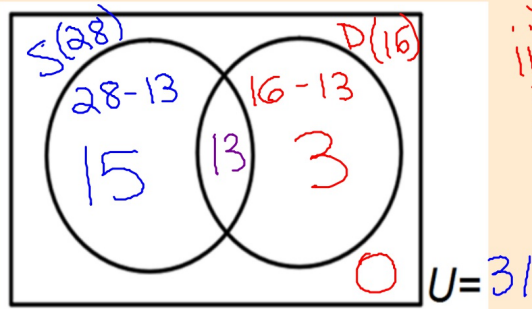
Badminton

3) A badminton club has 31 playing members. 28 play singles and 16 play doubles.

i) Create a Venn diagram.

ii) How many play both singles and doubles?

iii) What's the probability that a player randomly selected has played doubles, but no singles?



ii) 13 play both
 $28 + 16 - 31 = 13$

iii) $P(D \cap S') = \frac{3}{31}$

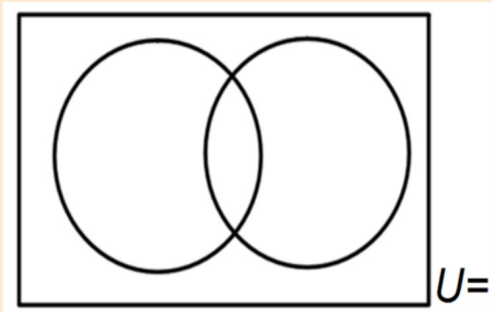
"Doubles and not singles"

Tennis & Netball

In a class of 40 students, 19 play tennis, 20 play netball, and 8 play neither of these sports. A student is randomly chosen from the class.

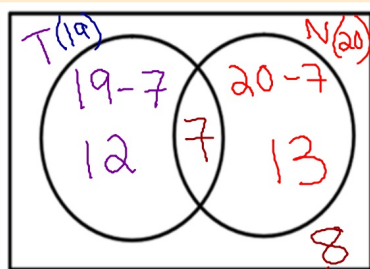
Determine the probability that the student:

- a) plays tennis
- b) does not play netball
- c) plays at least one of the two sports
- d) plays exactly one of the sports
- e) plays netball, given that they do not play tennis



Tennis & Netball

- 4 In a class of 40 students, 19 play tennis, 20 play netball, and 8 play neither of these sports. A student is randomly chosen from the class. Determine the probability that the student:
- a plays tennis
 - b does not play netball
 - c plays at least one of the two sports
 - d plays exactly one of the sports
 - e plays netball, given that they do not play tennis.



$$T \cap N = T + N - (T \cup N)$$

$$7 = 19 + 20 - 32$$

$$a) P(T) = \frac{19}{40}$$

$$b) P(N') = \frac{20}{40} = \frac{1}{2}$$

$$c) P(T \cup N) = \frac{32}{40} = \frac{4}{5}$$

$$d) P(T \cup N) - P(T \cap N)$$

$$\frac{32}{40} - \frac{7}{40} = \frac{25}{40} = \frac{5}{8}$$

$$e) \frac{P(N \text{ only})}{T'} = \frac{13}{21}$$

Measles & Mumps

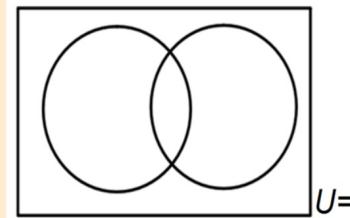
The medical records for a class of 30 children show whether they have previously had measles or mumps
24 have had measles,

12 have had measles AND mumps

26 have had measles OR mumps

If one child from the class is selected at random,
determine the probability that he or she has had:

- a) mumps
- b) mumps but not measles
- c) neither mumps nor measles



Measles & Mumps

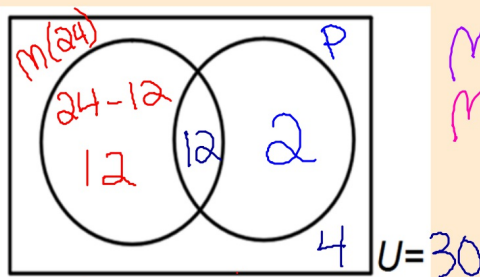
- 5 The medical records for a class of 30 children show whether they have previously had measles or mumps. 24 have had measles, 12 have had measles *and* mumps, and 26 have had measles *or* mumps. If one child from the class is selected at random, determine the probability that he or she has had:

a mumps

b mumps but not measles

c neither mumps nor measles.

M: Measles P: Mumps



$$M \cap P = 12$$

$$M \cup P = 26$$

Mumps only

$$26 - 24 = 2$$

$$30 - M \cup P = (M \cup P)'$$

$$(M \cup P)' = 4$$

a) mumps $P(P) = \frac{14}{30} = \frac{7}{15}$

b) mumps but not measles $P(M \cap P') = \frac{2}{30} = \frac{1}{15}$

c) neither mumps nor measles

$$P((M \cup P)') = \frac{4}{30} = \frac{2}{15}$$

Exercises:

- 1) Review notes and classwork
- 2) Finish exercises from Thursday and Monday
- 3) Bring all Venn diagram materials for partner assessment *practice* tomorrow (Wednesday).

Thursday: Partner assessment, closed notes.

Need a Challenge? Examine 3-set Venn diagram exercises.