Geometry
SPRING FINAL EXAM REVIEW 2023

Name: _____
Date: _____

UNIT 6 REVIEW – Trig Ratios

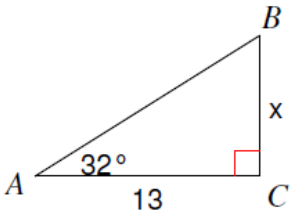
IMPORTANT IDEAS:

SOH – CAH – TOA

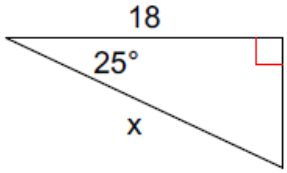
S – Sine	**C – Cosine**	**T – Tangent**
O – Opposite	**A – Adjacent**	**O – Opposite**
H – Hypotenuse	**H – Hypotenuse**	**A – Adjacent**

IN CLASS: Solve for the missing side or angle using Trig Ratios (sin, cos, tan).

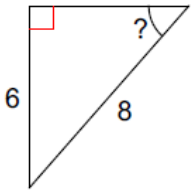
1.



2.



3.

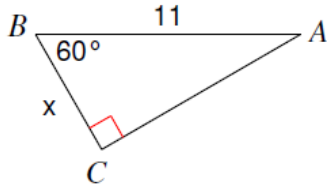


4. An 8-foot ladder is leaning against a wall so that the base is 5 feet from the base of the wall. What angle does the ladder make with the ground? Round to the nearest tenth.

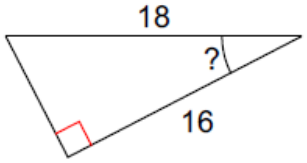
5. A surveyor is standing 25 feet from a building and is looking at the top with an angle of elevation of 65°. How tall is the building? Round to the nearest tenth.

ON YOUR OWN: Solve for the missing side or angle using Trig Ratios (sin, cos, tan).

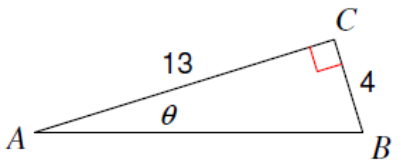
6.



7.



8.



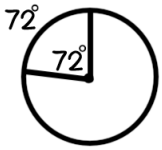
9. A kite is being flown using 150 yards of string. The kite has an angle of elevation with the ground of 65 degrees. How high above the ground is the kite?

10. A 70-foot escalator rises 16 feet vertically. What is the angle that the escalator makes with the floor?

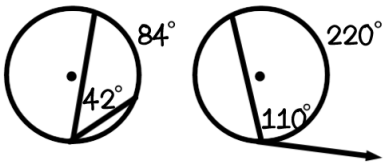
UNIT 7 REVIEW – Circles Part I

IMPORTANT IDEAS:

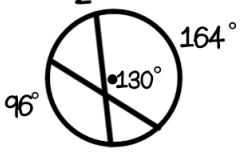
Central Angle
angle = arc



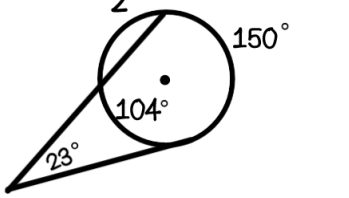
Vertex ON Circle
2(angle) = arc



Vertex INSIDE Circle
$\frac{\text{arc} + \text{arc}}{2}$ = angle

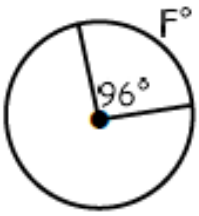


Vertex OUTSIDE Circle
$\frac{\text{big arc} - \text{lil arc}}{2}$ = angle

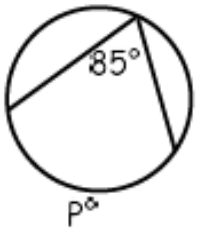


IN CLASS: Solve for the missing variable.

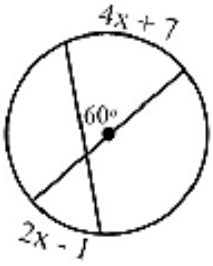
1. F = _____



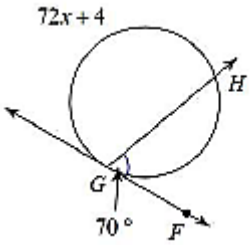
2. P = _____



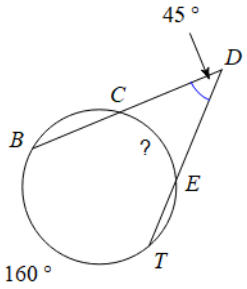
3. x = _____



4. x = _____

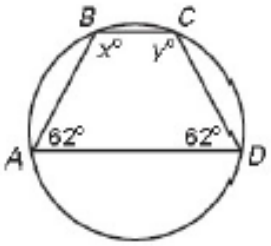


5. ? = _____



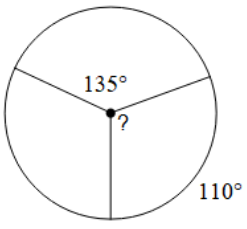
6. x = _____

7. y = _____

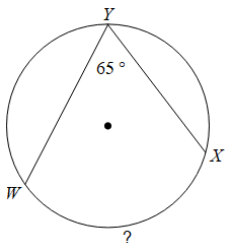


ON YOUR OWN:

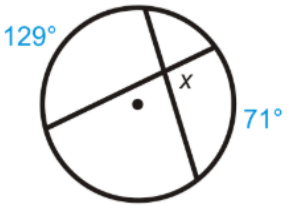
8. ? = _____



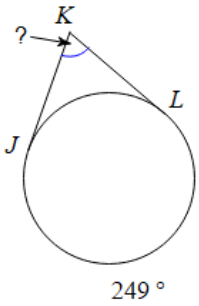
9. ? = _____



10. x = _____



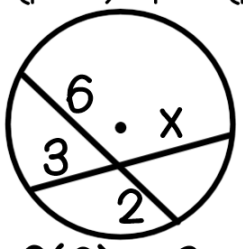
11. ? = _____



UNIT 8 REVIEW – Circles Part 2

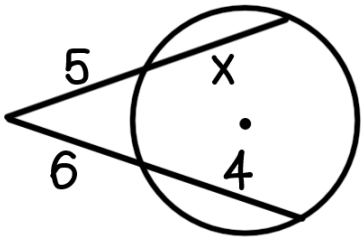
IMPORTANT IDEAS:

Chord-Chord
piece(piece) = piece(piece)



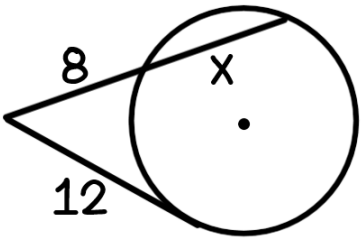
$6(2) = 3x$

Secant-Secant
outside(whole) = outside(whole)



$5(x+5) = 6(10)$

Secant-Tangent
outside(whole) = tangent^2

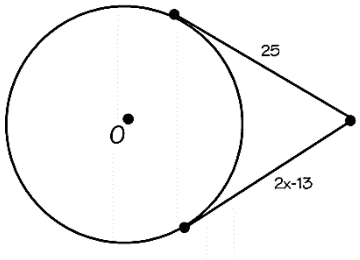


$8(x+8) = 12^2$

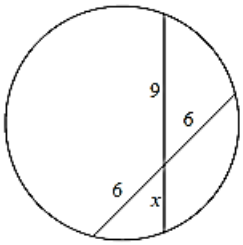
$$\text{Arc Length} = \frac{\theta}{360} * 2\pi r \qquad \text{Area of Sector} = \frac{\theta}{360} * \pi r^2$$

IN CLASS: Solve for the missing variable.

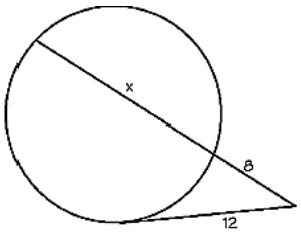
1. x = _____



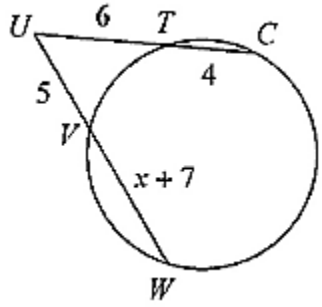
2. x = _____



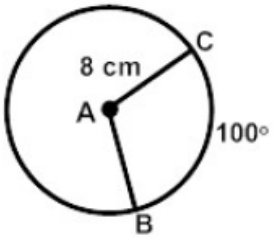
3. x = _____



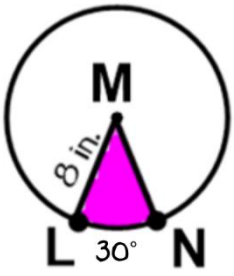
4. x = _____



5. Find the length of arc BC. Leave answer in terms of pi.

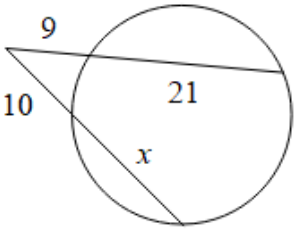


6. Find the area of sector. Leave answer in terms of pi.

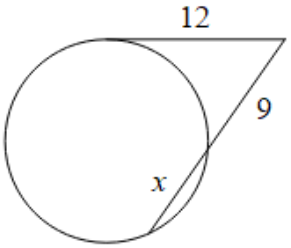


ON YOUR OWN:

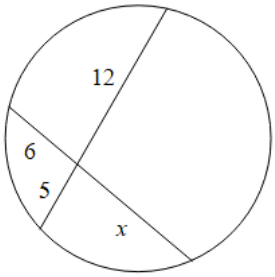
7. x = _____



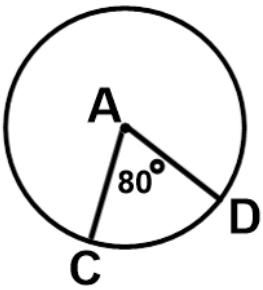
8. x = _____



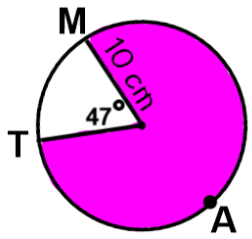
9. x = _____



10. Find the length of arc CD if AD = 5.



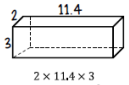
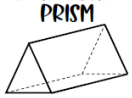
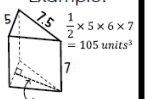
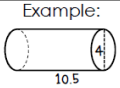
11. Find the area of the sector.

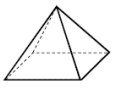
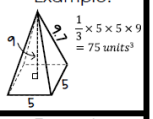
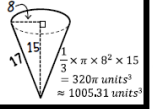
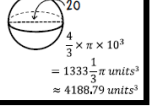


UNIT 9 REVIEW – Volume

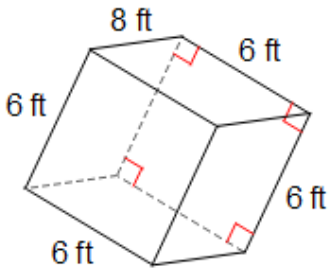
IMPORTANT IDEAS:

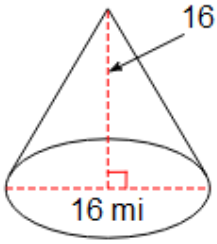
VOLUME REFERENCE SHEET

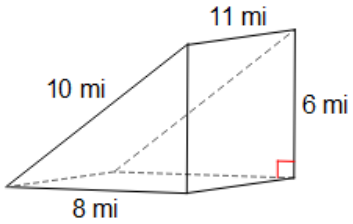
RECTANGULAR PRISM 	Shape of **B**ase: Rectangle Area Formula for **B**ase: $A = lw$	Volume Formula: $V = Bh$ V = area of Base x height	Example:  $2 \times 11.4 \times 3 = 68.4\ units^3$
TRIANGULAR PRISM 	Shape of **B**ase: Triangle Area Formula for **B**ase: $A = \frac{1}{2}bh$	Volume Formula: $V = Bh$ V = area of Base x height	Example:  $\frac{1}{2} \times 5 \times 6 \times 7 = 105\ units^3$
CYLINDER 	Shape of **B**ase: Circle Area Formula for **B**ase: $A = \pi r^2$	Volume Formula: $V = Bh$ V = area of Base x height	Example:  $\pi \times 2^2 \times 10.5 = 42\pi\ (\approx 131.95)\ units^3$

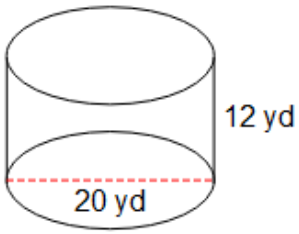
PYRAMID 	Shape of **B**ase: Rectangle (or other polygons) Area Formula for **B**ase: $A = lw$ (or others)	Volume Formula: $V = \frac{1}{3}Bh$ V = 1/3 x area of Base x height	Example:  $\frac{1}{3} \times 5 \times 5 \times 9 = 75\ units^3$
CONE 	Shape of **B**ase: Circle Area Formula for **B**ase: $A = \pi r^2$	Volume Formula: $V = \frac{1}{3}Bh$ V = 1/3 x area of Base x height	Example:  $\frac{1}{3} \times \pi \times 8^2 \times 15 = 320\pi\ units^3 \approx 1005.31\ units^3$
SPHERE 	No Base	Volume Formula: $V = \frac{4}{3}\pi r^3$ V = 4/3 x π x (radius cubed)	Example:  $\frac{4}{3} \times \pi \times 10^3 = 1333\frac{1}{3}\pi\ units^3 \approx 4188.79\ units^3$

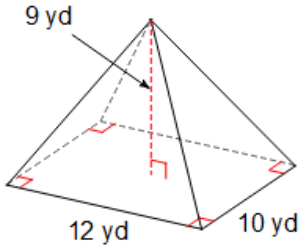
IN CLASS: Identify the shape and find the volume of each figure. Round your answer to the nearest tenth if necessary.

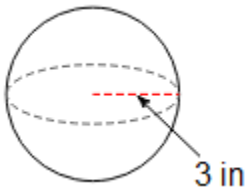
1. 

2. 

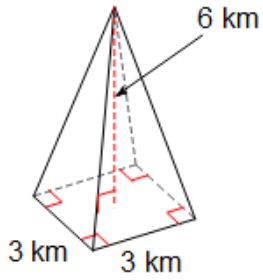
3. 

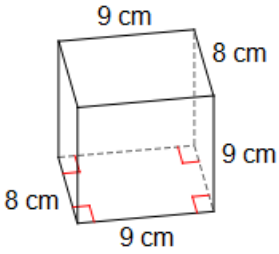
4. 

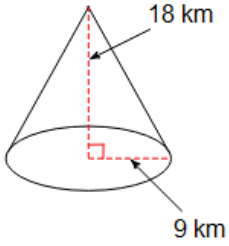
5. 

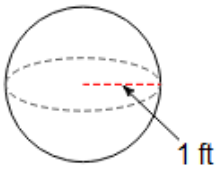
6. 

ON YOUR OWN: Identify the shape and find the volume of each figure. Round your answer to the nearest tenth if necessary.

7. 

8. 

9. 

10. 

UNIT 10 REVIEW – Modeling in the Coordinate Plane Part I

IMPORTANT IDEAS:

Equations of Circles

Standard Form: $(x-h)^2+(y-k)^2=r^2$

General Form: $ax^2+by^2+cx+dy+e=0$

- Two lines are **PARALLEL** if and only if their slopes are **EQUAL**.
  - > Any two **horizontal** lines (**y = #**) are parallel. (Slopes are both **0**.)
  - > Any two **vertical** lines (**x = #**) are parallel. (Slopes are both **undefined**.)

*** VUX HOY***

- Two lines are **PERPENDICULAR** if and only if their slopes are **NEGATIVE/OPPOSITE RECIPROCALS**.
  - > Two lines are perpendicular if and only if the product of their slopes is -1.
  - > A **horizontal** and a **vertical** line are always **perpendicular** to each other.

IN CLASS:

1. Given the equation of the circle, $(x - 0)^2 + (y + 4)^2 = 4$, determine the following.

   Center _____ b. radius _____

2. Write the equation of the circle in standard form: $x^2 + y^2 - 4x + 6y - 118 = 0$.

3. Write the equation $(x - 0)^2 + (y + 4)^2 = 4$ in general form.

4. Use the points (12, 4) and (18, 12) to calculate the following.

   A. Slope _____ B. distance _____ C. midpoint _____

5. Write the equation of the line parallel to $y = {}^1/_3x + 5$ and going through the point (-3, 10).

6. Write the equation of the line perpendicular to $5x - 3y = 6$ and going through the point (5, -6).

ON YOUR OWN:

7. $(x - 14)^2 + (y - 12)^2 = 20$

Center: _____

Radius: _____

8. Convert to general form.

$(x - 4)^2 + (y + 3)^2 = 30$

9. Convert to standard form.

$x^2 + y^2 - 12x + 6y + 21 = 0$

10. Line *p* contains points (2, 6) & (-2, 8)
Line *b* contains points (1, 5) & (3, 9)

$m_{line\ p}$ = _____ $m_{line\ b}$ = _____

11. Find the slope of a line parallel and perpendicular to the given line. $2y + 3x = 6$

$m_{\parallel}$ = _____ $m_{\perp}$ = _____

Circle one: **PARALLEL PERPENDICULAR NEITHER**

12. Write the equation of a line that is ***parallel*** to the line $y = 2x - 7$ and contains the point (-4, 5).

13. Write the equation of a line that is ***perpendicular*** to the line $y = 2x - 7$ and contains the point (-4, 5).

UNIT 11 REVIEW – Modeling in the Coordinate Plane Part 2

IMPORTANT IDEAS:

Partitioning Formula: $\left(x_1+\frac{a}{a+b}(x_2-x_1), y_1+\frac{a}{a+b}(y_2-y_1)\right)$

Distance Formula: $d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

Midpoint Formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Area Formulas: $A_{triangle}=\frac{1}{2}bh$ $A_{rectangle}=lw$ $A_{square}=s^2$

IN CLASS:

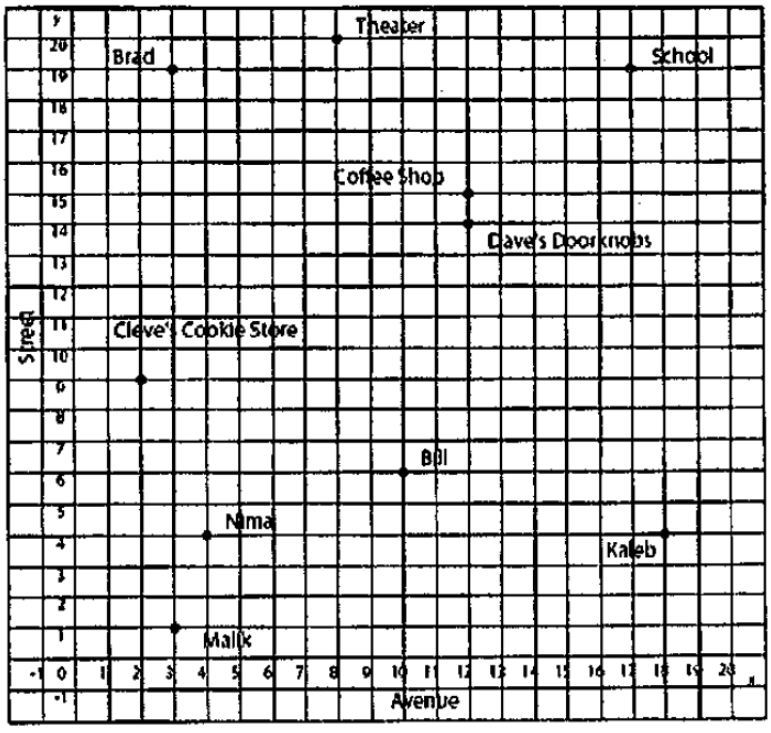
1. Find the point T so that the directed line segment from A(1, 2) to B(3, 9) is partitioned into a ratio of 2:3.

2. Using points A (22, 6) and B (7, -1), find point T that is two-fifths from point A.

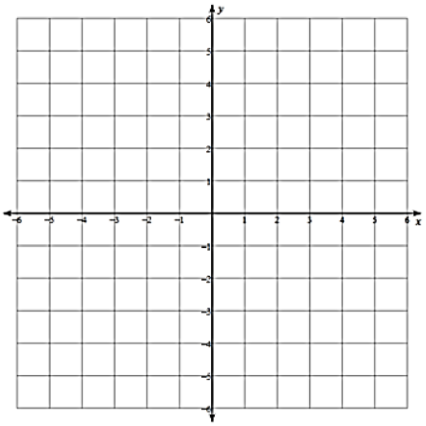
Use the map and the information given to solve each problem that follows.

3. Luis works at a theater on 8th Avenue and 20th Street. Kaleb lives at the corner of 18th Avenue and 4th Street. What is the location that is midway between them?

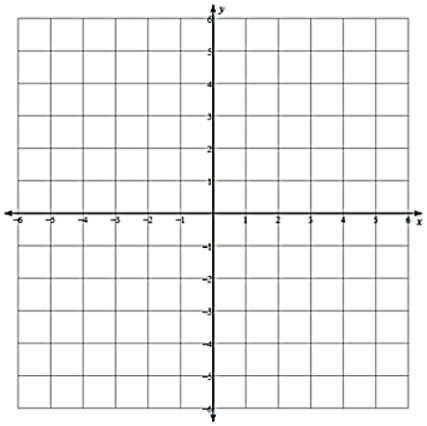
4. Nima lives at the corner of 4th Avenue and 4th Street. Bill lives at the corner of 10th Avenue and 6th Street. Their favorite bakery is located one-third the way from Nima's to Bill's house. Where is the bakery?



5. Find the perimeter.
I(1, 2), C(6, 5), and E(3, 6)



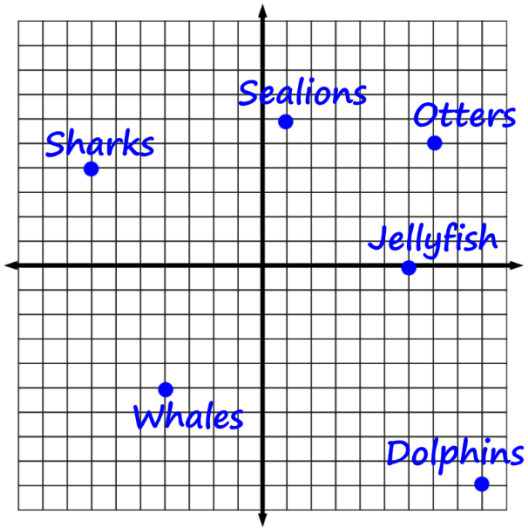
6. Find the area.
M(-5, 1), A(-1, 5), S(3, 1), and K(-1, -3)



ON YOUR OWN:

7. Find the coordinates of T that partitions A(0, 6) to B(-10, -8) in a 3:1 ratio.

Use the map of the aquarium to solve the questions.



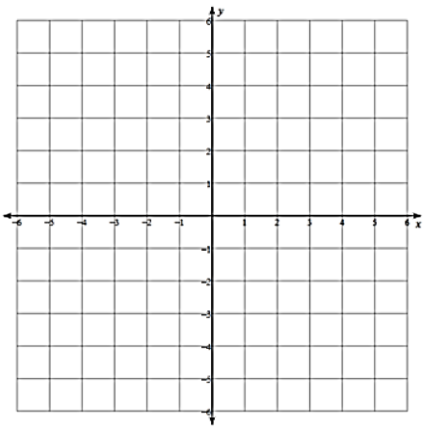
8. The crabs are located halfway between the sharks and the sealions. Where are the crabs located?

9. The penguin's distance from the sharks to the dolphins can be represented by the ratio 1:3. Where are the penguins?

10. The Finding Nemo display is located 5/7 the way from Otters to the Dolphins. Where is this display?

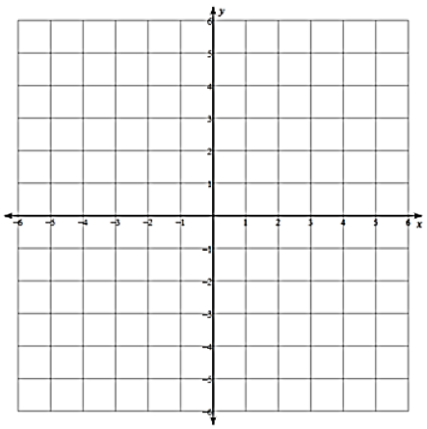
11. Find the perimeter.

M(2, 5), A(-3, 0), T(2, -5), and H(6, 0)



12. Find the area.

P(-3, -3), E(-3, 4), and N(4, 2)



UNIT 12 REVIEW – Probability

IMPORTANT IDEAS: **Notation:**

$\cup$ Union "OR"

$\cap$ Intersection "AND" overlap

A' or $\overline{A}$ Complement "NOT"

$B \mid A$ Conditional "GIVEN"

- Mutually Exclusive Events (no overlap): $P(A) + P(B)$
- Overlapping Events: $P(A) + P(B) - P(A \cap B)$
- Independent Events: $P(A)*P(B)$
- Dependent Events: $P(A)*P(B \text{ given } A)$

ON YOUR OWN:

1. A card is chosen from a standard deck of cards. The drawer is looking for clubs and face cards.

	Club	Not a Club	
Face card	3	9	
Not a face card	10	30	

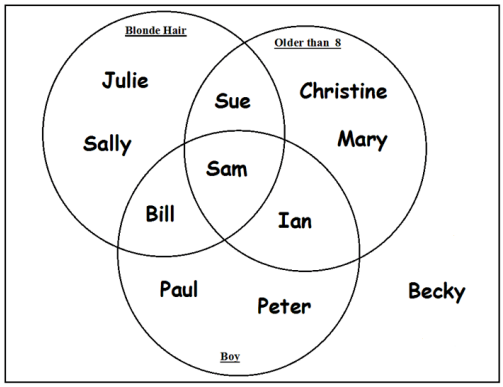
A. Find P(Not a Club)

B. Find P(Club | Face Card)

C. Find P(Club $\cap$ Face Card)

D. Find P(Not a Club $\cup$ Not a Face Card)

2. Use the Venn diagram to find the following probabilities.



A. P(blonde hair)

B. P(blonde hair $\cap$ Boy)

C. P(Older than 8 $\cup$ Boy)

D. P(Older than 8 $\cup$ Boy)'

3. **Circle Mutually Exclusive or Overlapping for the following scenarios. Then find the probability.**

A. What is the probability of rolling a die and landing on a 2 or a 5? ME O

B. A card is drawn from a standard deck of 52 cards. What is the probability the card will be a red or an ace? ME O

C. What is the probability of pulling out a card from a standard deck that is a queen or a diamond? ME O

D. What is the probability of rolling a die and getting a 5 or an even number? ME O

4. **Circle Independent or Dependent for the following scenarios. Then find the probability.**

A. What is the probability of drawing a queen from a standard deck of cards, replacing it, and then drawing another queen? I D

B. What is the probability of drawing a queen from a standard deck of cards, not replacing it, and then drawing another queen? I D

C. You have started collecting a bag of coins to save money for a car. There are 10 quarters, 6 dimes, 2 nickels, and 18 pennies. What is the probability you draw a quarter and then a dime, without replacement? I D