

March 18, 2019, Monday

Which transformation of  $\triangle MNO$  results in a congruent triangle?

DO NOT copy all the answer choices...only the correct one.

...review, then quiz!

Correct Answer: B

Geometry Unit 3 Quiz 1 - Review

**SohCahToa**

Find the value of each trigonometric ratio:

1)  $\tan Z$   $\tan \theta = \frac{o}{a}$   
 $\tan Z = \frac{2}{14}$   
 $\tan Z = 3.4$

2) If  $\cos \theta = \frac{5}{13}$ , find  $\sin(90^\circ - \theta)$  **co-functions**  
 $\sin(90^\circ - \theta) = \frac{o}{h}$   
 $\sin(90^\circ - \theta) = \frac{5}{13}$

3) If  $\tan \theta = \frac{12}{13}$ , find  $\tan(90^\circ - \theta)$   
 $\tan \theta = \frac{o}{a}$   
 $\tan \theta = \frac{12}{13}$   
 $\tan(90^\circ - \theta) = \frac{13}{12}$

4) If  $\tan \theta = \frac{45}{23}$ , find  $\sin \theta$   
 $\sin \theta = \frac{o}{h}$   
 Pythagorean Th:  $a^2 + b^2 = c^2$   
 $23^2 + 45^2 = c^2$   
 $c = 50$   
 $\sin \theta = \frac{45}{50}$

5) Find the missing side. Round to the nearest tenth.  
 $\cos \theta = \frac{a}{h}$   
 $\cos 49^\circ = \frac{12}{x}$   
 $x \cos 49^\circ = 12$   
 $x = \frac{12}{\cos 49^\circ}$   
 $x = 18.3$

6) Find the measure of  $\theta$ . Round to the nearest degree.  
 $\sin \theta = \frac{o}{h}$   
 $\sin \theta = \frac{21}{25}$   
 $\theta = 53^\circ$

quiz...

Day 5 Applications Right Triangle Trig.notebook **SohCahToa**

6) A tree casts a shadow 70 feet long at an angle of elevation of  $30^\circ$ . How tall is the tree?  
 $\tan \theta = \frac{o}{a}$   
 $\tan 30^\circ = \frac{x}{70}$   
 $x = 70 \tan 30^\circ$   
 $x = 40.4$

7) You are looking up at a fourth story window, 40 feet up in a building. You are 100 feet away from the building, across the street. What is the angle of elevation?  
 $\tan \theta = \frac{o}{a}$   
 $\tan \theta = \frac{40}{100}$   
 $\theta = 21.9^\circ$

7) John wants to measure the height of a tree. He walks exactly 100 feet from the base of the tree and looks up. The angle from the ground to the top of the tree is  $33^\circ$ . How tall is the tree?  
 $\tan \theta = \frac{o}{a}$   
 $\tan 33^\circ = \frac{x}{100}$   
 $x = 100 \tan 33^\circ$   
 $x = 64.3$

8) A building is 34 feet high and a window is 10 feet above the ground. An observer notices that the angle of elevation to the top of the building is  $47^\circ$ . How far is the observer from the base of the building?  
 $\tan \theta = \frac{o}{a}$   
 $\tan 47^\circ = \frac{44}{x}$   
 $x \tan 47^\circ = 44$   
 $x = \frac{44}{\tan 47^\circ}$   
 $x = 57.5$

Day 5 Applications Right Triangle Trig.notebook

9) A bird sits on top of a lamppost. The angle of depression from the bird to the feet of an observer standing away from the lamppost is  $25^\circ$ . The distance from the bird to the observer is 25 meters. How tall is the lamppost?

30) An airplane is flying at a height of 2 miles above the ground. The distance along the ground from the airplane to the airport is 2 miles. What is the angle of depression from the airplane to the airport?

Oct 10 10:28 AM

Geometry - Unit 3 Day 6, 3/15/2017 Applications of Trig Ratios HW Name \_\_\_\_\_

Directions: Solve the following application problems, draw a picture for each problem. Show the trigonometric ratios used and solve showing ALL work. Round all measures of segments to the nearest hundredth and round all angle measures to the nearest degree.

- A tree casts a shadow 2.1m long. The angle of elevation of the sun is  $51^\circ$ . What is the height of the tree?
- You are flying a kite and have let out 60m of string. The kite's angle of elevation with the ground is  $40^\circ$ . If the string is stretched straight, how high is the kite above the ground?
- A 15m pole is leaning against a wall. The foot of the pole is 30m from the base of the wall. Find the angle that the pole makes with the ground.
- A guy wire reaches from the top of a 120m television transmitter tower to the ground. The wire makes a  $63^\circ$  angle with the ground. Find the length of the guy wire.
- An airplane climbs at an angle of  $18^\circ$  with the ground. Find the ground distance the plane travels as it moves 2,500m through the air.
- A lighthouse operator at point P 25m above sea level sights a sailboat at point S. The angle of depression of the sighting is  $10^\circ$ . How far is the boat from the base of the lighthouse?
- Two trees stand opposite one another, at points A and B, on opposite banks of a river. Distance AC along one bank is perpendicular to AB, and is measured to be 100 feet. Angle ACB is measured to be  $79^\circ$ . How far apart are the two trees?

- 8) Find the measure of height,  $h$ , of a flagpole when the shadow is 100 feet from its base (point  $P$ ). The angle of elevation from point  $P$  to the top of the flagpole is  $37^\circ$  as shown in the diagram below.
- 9) A lighthouse is 62 feet tall. If the angle of depression the light house keeper has to the boat is  $36^\circ$ , how far away is the boat from the light house?
- 10) Triangle  $ABC$  and triangle  $MNL$  are similar triangles. If  $BC = 10$ ,  $ML = 30$ , and  $\sin M = 2/5$ , what is the length of  $AC$ ? What is the measure of angle  $M$ ?
- 11) A ladder makes a  $21^\circ$  angle with the ground. How long is the ladder if it reaches 19 feet up the wall?
- 12) A 12 foot ladder is leaning against the wall of a building. If the ladder makes a  $38^\circ$  angle with the wall, how far is the base of the ladder from the wall?
- 13) A plane took off from the runway. When the plane had flown 4km, it had covered a horizontal distance of 3.6km. Find the angle of elevation at which the plane rose from the ground.
- 14) Jane is standing 40 feet from the base of an oak tree. She measures the angle of elevation of the line of sight from a point on the ground to the top of the tree to be  $62^\circ$ . How tall is the tree?

### Unit 3 Test Review

**March 19, 2019, Tuesday**

Rectangle  $ABCD$  has points  $A(2, 2)$ ,  $B(6, 2)$ ,  $C(6, 8)$ , and  $D(2, 8)$ . The rectangle maps to  $A'B'C'D'$  such that  $(x, y) \rightarrow (y, -x)$ .

Which statement is true about the transformation of  $ABCD$  to  $A'B'C'D'$ ?

- $ABCD$  maps to  $A'B'C'D'$  by a reflection over the  $x$ -axis, and  $B'$  is located at  $(2, -6)$ .
- $ABCD$  maps to  $A'B'C'D'$  by a reflection over the  $y$ -axis, and  $B'$  is located at  $(6, -2)$ .
- $ABCD$  maps to  $A'B'C'D'$  by a  $90^\circ$  clockwise rotation about the origin, and  $B'$  is located at  $(2, -6)$ .
- $ABCD$  maps to  $A'B'C'D'$  by a  $90^\circ$  clockwise rotation about the origin, and  $B'$  is located at  $(6, -2)$ .

Geometry ~ U2 Day 6      TTTD Applications of Trig Ratios      Name \_\_\_\_\_

- You are standing 25 ft from the foot of a tree. The angle of elevation as you look at the top of the tree is  $32^\circ$ . How tall is the tree that you are looking at?
- A ladder leans against a building. The foot of the ladder is 6 ft from the building and you know the length of the ladder is 14 ft. What is the angle of elevation that the ladder makes with the ground?
- From the top of a barn 25 ft tall you see a cat on the ground. The angle of depression of the cat is  $40^\circ$ . How many feet must the cat walk to reach the barn?
- An airplane is flying at a height of 2 miles above the ground. The distance along the ground from the airplane to the airport is 5 miles. What is the angle of depression from the airplane to the airport?
- A bird sits on top of a lamppost. The angle of depression from the bird to the feet of an observer standing away from the lamppost is  $35^\circ$ . The observer is 25 meters from the lamppost. How tall is the lamppost?
- Billy's kite has a string 40 ft long and is flying 27 ft from the ground. Find the angle of elevation of the kite.

Geometry      Name \_\_\_\_\_      ID: 1

Solving a triangle = find ALL missing sides and ALL missing angles.      Period \_\_\_\_\_

Solve each triangle. Round answers to the nearest tenth.

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In each problem, angle  $C$  is a right angle. Solve each triangle rounding answers to the nearest tenth.

- $m\angle B = 32^\circ$ ,  $c = 3$
- $m\angle B = 58^\circ$ ,  $a = 9$

Solve each triangle. Round answers to the nearest tenth.

- $m\angle A = 60^\circ$ ,  $a = 20.8$ ,  $c = 24$
  - $m\angle A = 60^\circ$ ,  $a = 20.5$ ,  $c = 25.5$
  - $m\angle A = 60^\circ$ ,  $a = 20.5$ ,  $c = 21.4$
  - $m\angle A = 61.4^\circ$ ,  $a = 20.8$ ,  $c = 21.4$
- $m\angle B = 61.1^\circ$ ,  $b = 15$ ,  $c = 17.5$
  - $m\angle B = 58.4^\circ$ ,  $b = 15$ ,  $c = 17.5$
  - $m\angle B = 59^\circ$ ,  $b = 15$ ,  $c = 17.5$
  - $m\angle B = 60.3^\circ$ ,  $b = 15$ ,  $c = 17.5$

March 20, 2019, Wednesday

In this figure,  $\angle n$ , Jessie listed the first two steps in a proof that shows  $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$ .

Step	Justification
1	$\angle 2 \cong \angle 4$ ?
2	$\angle 3 \cong \angle 5$ ?

Which justification can Jessie give for Steps 1 and 2?

- Alternate interior angles are congruent.
- Corresponding angles are congruent.
- Vertical angles are congruent.
- Alternate exterior angles are congruent.

Name \_\_\_\_\_

Geometry - Day 6, 3/16/2017  
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Unit 3 Test Review

Find the value of the trig function indicated.

- $\tan \theta$
- $\cos \theta$
- $\sin \theta$
- $\tan \theta$
- $\sin \theta$
- $\cos \theta$
- Find  $\sin \theta$  if  $\tan \theta = \frac{3}{4}$
- Find  $\tan \theta$  if  $\cos \theta = \frac{4\sqrt{7}}{11}$
- Find  $\sin \theta$  if  $\tan \theta = \frac{4}{3}$
- Find  $\sin \theta$  if  $\cos \theta = \frac{7}{25}$

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- Find  $\cos \theta$  if  $\tan \theta = \frac{5}{12}$
- Find  $\cos \theta$  if  $\sin \theta = \frac{15}{17}$

Find the measure of each side indicated. Round to the nearest tenth.

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Find the measure of each angle indicated. Round to the nearest tenth.

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Solve each triangle. Round answers to the nearest tenth.

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- A flag pole casts a shadow 14 feet long. The angle of elevation of the sun is  $31^\circ$ . What is the height of the flag pole?
- An airplane climbs at an angle of  $23^\circ$  with the ground. If the plane has traveled a ground distance of 2790 miles, how far has it climbed through the air?
- An 18 ft ladder is leaning against the wall of a building. If the ladder reaches 10 ft up the building, what is the angle of depression created with the building?
- A lighthouse is 84 ft tall. If the angle of depression the light house keeper has to a boat in the distance is  $32^\circ$ , how far away is the boat from the lighthouse?
- A ladder makes a  $25^\circ$  angle with the ground. How long is the ladder if it the base sits 11 ft from the base of a building?

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March 21, 2019, Thursday

Triangle  $GHI$  is a right triangle. Angle  $G$  has a measure of  $g^\circ$ , angle  $H$  has a measure of  $h^\circ$ , and angle  $I$  is a right angle.

Part A

Which equation must be true?

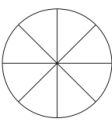
- $\sin(h^\circ) = \sin(g^\circ)$
- $\cos(g^\circ) = \sin(h^\circ)$
- $\cos(h^\circ) = \cos(g^\circ)$
- $\sin(h^\circ) + \cos(h^\circ) = \tan(h^\circ)$

If you are not drawing a sketch of this problem...you are not working it!

...test

March 22, 2019, Friday

Billy is creating a circular garden divided into 8 equal sections. The diameter of the garden is 12 feet.



What is the area, in square feet, of one section of the garden? Use  $\pi = 3.14$ . Explain how you determined your answer. Write your answer in the space provided.


Copy the following Probability vocabulary!!


**Basic Definitions Summarized**

**S (Sample Space)** → Consists of all possible outcomes  
**Sample point** → Each outcome  
**Event** → Set of some or all outcomes  
**U = "union"**    **∩ = "intersection"**


**A ∪ B** is "either A or B or both"  
**A ∩ B** is "both A and B"  
**A'** is "not A"  
**A - B** is "A but not B"  
**A ⊆ D** is "A is a subset of D"  
**D ⊃ A** is "A is contained in D"

- The **complement** A of an event A is the event that A does not occur
- Probability Rule 3:**  
 $P(A') = 1 - P(A)$
- The **union** of two events A and B is the event that either A or B or both occurs
- The **intersection** of two events A and B is the event that both A and B occur


Event A




Complement of A



Union of A and B



Intersection of A and B



Geometry - U6 Day 1, 4/21/2017 "How Odd?" Task Part 1

Supplies: Two 6-sided dice or a TI-30 Multiview or TI-84 calculator

- Roll your pair of dice 30 times, each time recording a success if one or both of the dice show an odd number and a failure if the dice do not show an odd number. Keep a tally in the boxes below.
 

Number of Successes		Number of Failures	
Total Successes:		Total Failures:	
- Based on your trials, what would you estimate the probability of two dice showing at least one odd number? Explain your reasoning.
- You have just calculated an **experimental probability**. Thirty trials is generally sufficient to estimate the **theoretical probability**; the probability of what you expect to happen based upon fair chance. For instance, if you flip a coin ten times you expect the coin to land on heads and tails five times each. In reality though, we know that this does not happen every time you flip a coin ten times.

a. A lattice diagram is useful in finding the theoretical probabilities for two dice tossed together. An incomplete lattice diagram is shown on the back of this page. Each possible way the two dice can land, also known as an outcome, is represented as an ordered pair: (1, 1) represents each die landing on a 1, while (4, 5) would represent the first die landing on 4 and the second landing on 5. Why does it have 36 pairs to be filled?

b. Complete the lattice diagram for rolling two dice. The 36 entries in your dice lattice represent the **sample space** for two dice tossed. The sample space for any probability model is all the possible outcomes.

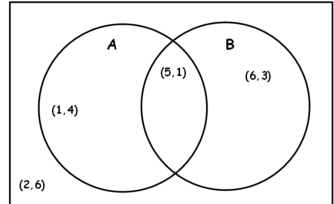
Dice Lattice

(1, 1)	(1, 2)	(1, 3)	( , )	( , )	( , )
(2, 1)	( , )	( , )	( , )	( , )	( , )
( , )	( , )	( , )	( , )	( , )	( , )
( , )	( , )	( , )	( , )	( , )	( , )
( , )	( , )	( , )	( , )	( , )	( , )
( , )	( , )	( , )	( , )	( , )	( , )

- It is often necessary to list the sample space and/or the outcomes of a set using **set notation**. For the dice lattice above, the set of all outcomes where the first roll was a 1 can be listed as:  $\{(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6)\}$ . This set of outcomes is a **subset** of the set because all of the elements of the subset are also contained in the original set. State the subset that contains all the elements that add to 9.
- What is the probability that the sum of two dice tossed will be 9?
- Using your lattice, determine the probability of having at least one of the two dice show an odd number.

4) The different outcomes that determine the probability of rolling odd can be visualized using a Venn Diagram, the beginning of which is seen below. Each circle represents the possible ways that each die can land on an odd number. Circle A is for the first die landing on an odd number, and Circle B is for the second die landing on an odd number. The circles overlap because some rolls of the two dice will result in both dice landing on odd numbers. In each circle, the overlap, and the area outside the circles, one of the ordered pairs from the lattice has been placed. (1, 1) appears in Circle A because the first die is odd, (6, 3) appears in Circle B because the second die is odd, (5, 1) appears in both circles at the same time (the overlap) because each die is odd, and (2, 6) appears outside of the circles because neither die is odd.

a. Finish the Venn Diagram by placing each of the remaining 32 ordered pairs from the dice lattice in the appropriate place.



- How many outcomes appear in Circle A? (Remember, if ordered pairs appear in the overlap, they are still within Circle A.)
- How many outcomes appear in Circle B?
- The portion of the circles that overlap is called the **intersection**. The notation used for intersections is  $\cap$ . For this Venn Diagram the intersection of A and B is written  $A \cap B$  and is read as "A intersect B" or "A and B". How many outcomes are in  $A \cap B$ ?
- When you look at different parts of a Venn Diagram together, you are considering the **unions** of the two outcomes. The notation for unions is  $\cup$ , and for this diagram the union of A and B is written  $A \cup B$  and is read "A union B" or "A or B". In the Venn Diagram you created,  $A \cup B$  represents all the possible outcomes where an odd number shows. How many outcomes are in the union?
- Record your answers to b, c, d, and e in the table below.
 

b. Circle A	c. Circle B	d. $A \cap B$	e. $A \cup B$
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- How is your answer to e related to your answers to b, c, and d?
- Based on what you have seen, make a conjecture about the relationship of A, B,  $A \cup B$ , and  $A \cap B$ .
- What outcomes fall outside of  $A \cup B$  (outcomes we have not yet used)? Why haven't we used these outcomes yet?

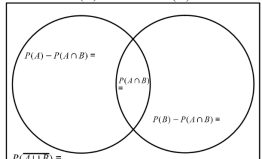
In a Venn Diagram the set of outcomes that are not included in some set is called the complement of that set. The notation for the complement of set A is  $\bar{A}$ , read "A bar," or "A, read "not A." For example, in the Venn Diagram you completed above, the outcomes that are outside of  $A \cup B$  are denoted  $\bar{A \cup B}$ .

- Which outcomes appear in  $\bar{A - B}$ ?
- Which outcomes appear in  $\bar{B - (A \cap B)}$ ?

5) The investigation of the Venn Diagram in question 4 should reveal a new way to see that the probability of rolling at least one odd number on two dice is  $\frac{27}{36} = \frac{3}{4}$ . How does the Venn Diagram show this probability?

6) Venn Diagrams can also be drawn using probabilities rather than outcomes. The Venn Diagram below represents the probabilities associated with tossing two dice together. In other words, we will now look at the same situation as we did before, but with a focus on probabilities instead of outcomes.

a. Fill in the remaining probabilities in the Venn Diagram.



- Find  $P(A \cup B)$  and explain how you can now use the probabilities in the Venn Diagram rather than counting outcomes.
- Use the probabilities in the Venn Diagram to find  $P(\bar{B})$ .
- What relationship do you notice between  $P(B)$  and  $P(\bar{B})$ ?

Geometry – U6 Day 1, 4/21/2017 “How Odd?” Task Part 2 Name \_\_\_\_\_

Venn Diagrams can also be used to organize different types of data, not just common sets like that generated from rolling two dice. Let’s say we want to investigate the popularity of different genres of music in Sue’s math class, particularly Hip Hop and Country music.

1) The results of the poll of her class is shown in the table below:

Hip Hop (HH)	Country (C)	Neither (N)
Dave	Sue	Lee
Melissa	Jim	James
Robert	Rebecca	Dean
Patti	Lori	Maria
Logan	Stuart	Aidan
Anita	Robert	Kyle
Emma	Patti	
Renee	Anita	
Austin	Sarah	
	Renee	
	Greg	
	Steve	
	John	
	Austin	

Draw a Venn Diagram to organize your outcomes.

2) Find  $P(HH)$ .

3) Find  $P(\bar{C})$ .

4) Find  $P(HH \cap C)$ .

5) Find  $P(HH \cup C)$ .

6) In Part 1, you found the relationship between  $A, B, A \cup B$ , and  $A \cap B$  to be  $A \cup B = A + B - (A \cap B)$ . In a similar way, write a formula for  $P(A \cup B)$ .

7) Now find  $P(HH \cup C)$  using the formula instead of the Venn Diagram. Did you get the same answer as you did in 5 above?

8) In what situation might you be forced to use the formula instead of a Venn Diagram to calculate the union of two sets?