Unit: Plane Geometry & Similarity
Student Handout 1

Name _____

Date _____Pd_____

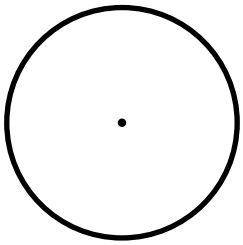
CIRCUMFERENCE OF A CIRCLE

PARTS OF A CIRCLE

A circle has many specific parts including the:

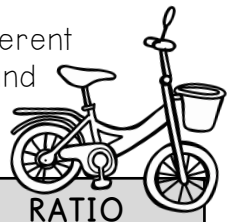
- _____ , r: the distance from the center of the circle to the outside edge
- _____ , d: a straight line that passes through the center of the circle; it has two endpoints on the circle
- _____ , C: the distance around a circle

Label the parts of the circle at the right.

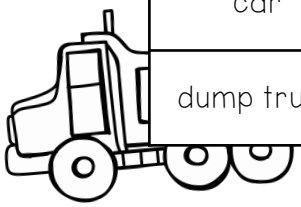


a. Using your labeled diagram, describe how the diameter and radius are related.

Micah and his friends work at a tire factory. The factory manufactures several different sized tires for different vehicles. Fill out the table below to show how the diameter and the circumference of the tires are related.



VEHICLE	DIAMETER OF TIRE	CIRCUMFERENCE OF TIRE	RATIO SET UP (C/D)	RATIO SIMPLIFIED
toddler bike	14 inches	43.96 inches	$\frac{43.96}{14}$	
bike	18 inches	56.52 inches		
car	24 inches	75.36 inches		
dump truck	36 inches	113.04 inches		



b. What patterns do you notice regarding the circumference and the diameter of each tire?

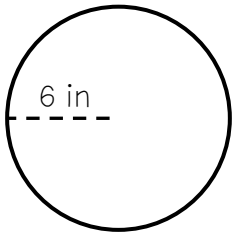
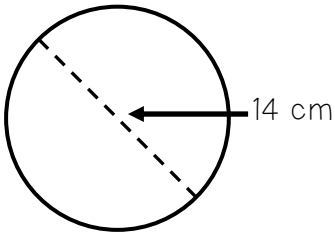
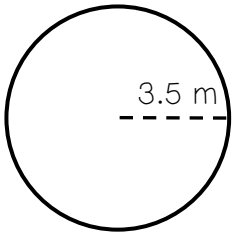
CIRCUMFERENCE

- The circumference of a circle is the distance around the circle. It can be found using two formulas:

  _____ or _____

- π can be approximated to _____

Using the diameter and radii given below, find the circumference of the circles.

CIRCLE 1	CIRCLE 2	CIRCLE 3
		
Formula: _____	Formula: _____	Formula: _____
Plug in Values: _____	Plug in Values: _____	Plug in Values: _____
In terms of π: _____	In terms of π: _____	In terms of π: _____
Circumference: _____	Circumference: _____	Circumference: _____

Use your knowledge of circumference and circles to answer question 1.

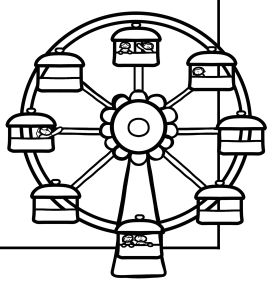
1. A Ferris wheel travels in a circular motion and measures 40 meters from the top car to the bottom car.

a. What is the length of the radius of the Ferris wheel?

b. What is the length of the diameter of the Ferris wheel?

c. A car travels one time around the Ferris wheel. How many meters did the car travel?

d. On another Ferris wheel, a car will travel 100.48 meters to go once around the wheel. What is the height from the top car to the bottom car?



Summarize today's lesson:

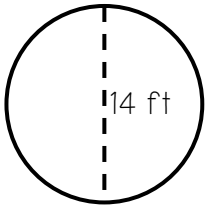
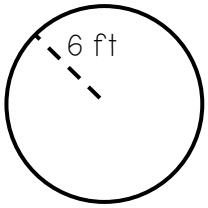
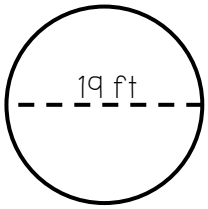
Unit: Plane Geometry & Similarity
Homework 1

Name _____

Date _____Pd_____

CIRCUMFERENCE OF A CIRCLE

Draw a line connecting each circle to the appropriate radius, diameter, and circumference.

CIRCLE	RADIUS	DIAMETER	CIRCUMFERENCE
1. 	4 feet	12 feet	59.66 feet
	6 feet	15 feet	34.54 feet
2. 	7.5 feet	19 feet	15.7 feet
	9.5 feet	22 feet	28.26 feet
	8 feet	16 feet	37.68 feet
3. 	7 feet	14 feet	43.96 feet
	10.5 feet	11 feet	18.84 feet

Use your understanding of circumference to answer the questions below.

4. An electric toy train travels around a Christmas tree in a circle. The train track measures 6 feet in diameter. What is the distance that the train travels?

5. A tree is sold based on the circumference of its trunk. If a tree trunk has a radius of 4 inches, then what is the circumference of the tree trunk?

6. Erin runs laps around a circular pond with a radius of 12 yards. She calculated the total distance she would run after ten laps around the pond. Is Erin's calculation correct? If not, correct her work.

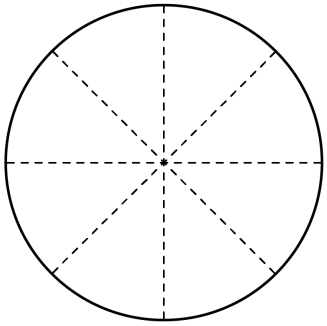
C = (3.14) (12) (10)
C = 37.68 (10)
C = 376.8 yards

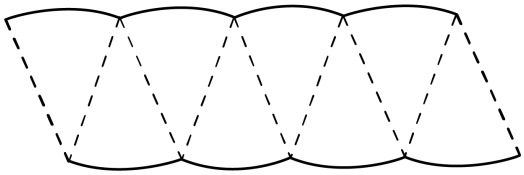
Unit: Plane Geometry & Similarity
Student Handout 2

Name _____
Date _____Pd_____

AREA OF A CIRCLE

Professor Smart is teaching her students how the formula for the area of a circle was derived. She cuts a circle into equal pieces and rearranges them below.





A =

A =

A =

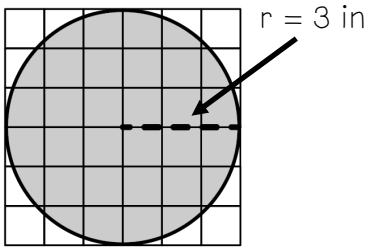
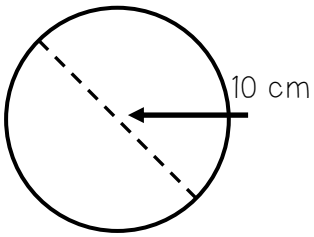
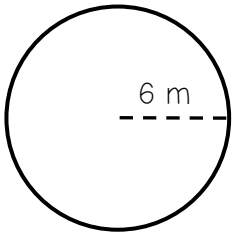
a. What general 2D figure do you see when the pieces are rearranged? What is the formula for the area of that shape?

b. Based on the diagram above, how is the circumference of the circle related to the length of the parallelogram?

AREA OF A CIRCLE

- Area is the surface measurement of a two-dimensional figure. It is the _____ that cover a circle.
- Use the formula _____, where r^2 is equal to _____.

Using the diameter and radii given below, find the area of the circles.

CIRCLE 1	CIRCLE 2	CIRCLE 3
		
Formula: _____	Formula: _____	Formula: _____
Plug in Values: _____	Plug in Values: _____	Plug in Values: _____
In terms of π: _____	In terms of π: _____	In terms of π: _____
Area: _____	Area: _____	Area: _____

Use your understanding of the area of circles to answer the following questions.

1. A circle has an area of 78.5 square inches. What is the radius of the circle?	2. A circular sprinkler system is installed and waters an area of 28.26 yards^2. What is the radius of the circle?

3. Jada says that if you are given the circumference of a circle, you have enough information to find the area of the circle. Is Jada correct? Why or why not?

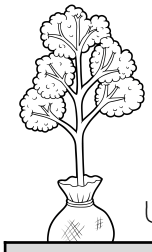
4. Determine whether area or circumference is described by each statement below.

a. The amount of fencing around a circular garden. area or circumference

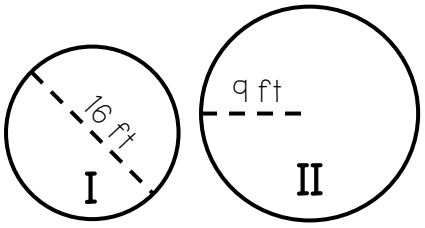
b. The amount of frosting needed to cover a cookie. area or circumference

c. The amount of crust needed to cover a pie. area or circumference

d. The distance traveled in one lap around a circular track. area or circumference



Use the image at the right to answer the question below.



5. Two different trees are being planted in an outdoor garden. Each tree requires a specific amount of space for the roots to grow. How much more space will tree II require?

I KNOW:	I NEED TO KNOW:
PLAN AND WORK:	SOLUTION:

Summarize today's lesson:

Unit: Plane Geometry & Similarity
Homework 2

Name _____

Date _____ Pd_____

AREA OF A CIRCLE

Ben and Luna were asked to find the area of a circle with a diameter of 9 cm. Use their work to answer questions 1-2.

BEN

$A = 3.14 (9^2)$

$A = 3.14 (81)$

$A = 254.34 \text{ cm}^2$

LUNA

$A = 3.14 (4.5^2)$

$A = 3.14 (9)$

$A = 28.26 \text{ cm}^2$

1. Describe Ben's mistake in solving for the area of the circle.

2. Describe Luna's mistake in solving for the area of the circle.

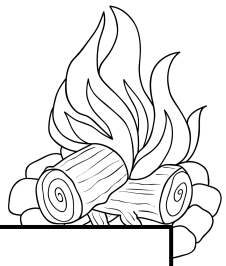
3. After identifying each of the mistakes that Ben and Luna made, find the correct area of the circle. Round your answer to the nearest hundredth.

Answer the questions below using your understanding of circles.

4. Place a checkmark by the situations that indicate area.

A. The distance a tire travels in one rotation.

B. The amount of cheese used to cover a pizza.



C. How much space a circular rug takes up.

D. The distance a car travels around a traffic circle.

E. The distance around a campsite fire.

5. A stadium floor that is in the shape of a circle has a diameter of 50 yards. What is the area of the stadium floor?

6. A flower bed surrounds the base of a tree. It is enclosed by stones to form a circle that measure 25.12 feet around. What is the radius of the circle?

Unit: Plane Geometry & Similarity
Student Handout 1

Name _____
Date _____ Pd_____

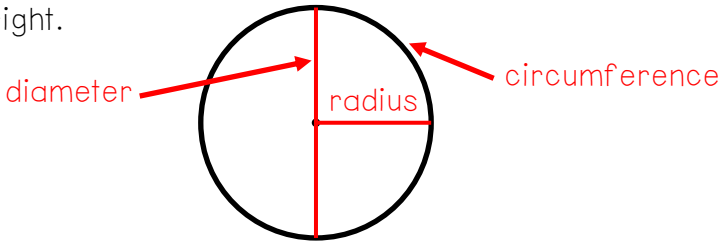
CIRCUMFERENCE OF A CIRCLE

PARTS OF A CIRCLE

A circle has many specific parts including the:

- radius, r: the distance from the center of the circle to the outside edge
- diameter, d: a straight line that passes through the center of the circle; it has two endpoints on the circle
- circumference, C: the distance around a circle

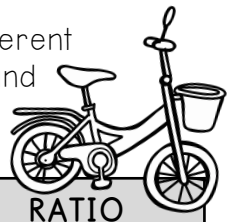
Label the parts of the circle at the right.



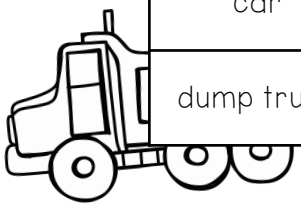
a. Using your labeled diagram, describe how the diameter and radius are related.

Ex: The diameter is twice the radius, and the radius is half the length of the diameter.

Micah and his friends work at a tire factory. The factory manufactures several different sized tires for different vehicles. Fill out the table below to show how the diameter and the circumference of the tires are related.



VEHICLE	DIAMETER OF TIRE	CIRCUMFERENCE OF TIRE	RATIO SET UP (C/D)	RATIO SIMPLIFIED
toddler bike	14 inches	43.96 inches	$\frac{43.96}{14}$	3.14
bike	18 inches	56.52 inches	$\frac{56.52}{18}$	3.14
car	24 inches	75.36 inches	$\frac{75.36}{24}$	3.14
dump truck	36 inches	113.04 inches	$\frac{113.04}{36}$	3.14



b. What patterns do you notice regarding the circumference and the diameter of each tire?

Ex: The circumference divided by the diameter results in approximately 3.14 which is π.

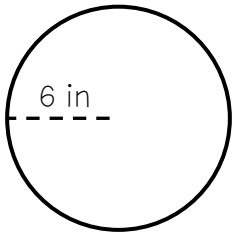
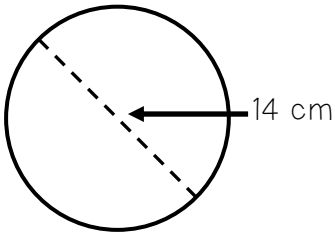
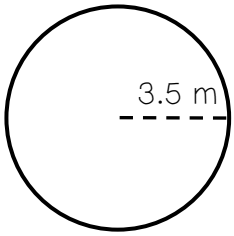
CIRCUMFERENCE

- The circumference of a circle is the distance around the circle. It can be found using two formulas:

  $C = \pi d$ or $C = 2\pi r$

- π can be approximated to 3.14

Using the diameter and radii given below, find the circumference of the circles.

CIRCLE 1	CIRCLE 2	CIRCLE 3
		
Formula: $C = 2\pi r$	Formula: $C = \pi d$	Formula: $C = 2\pi r$
Plug in Values: $C = 2(3.14)(6)$	Plug in Values: $C = 3.14(14)$	Plug in Values: $C=2(3.14)(3.5)$
In terms of π: $C = 12\pi$	In terms of π: $C = 14\pi$	In terms of π: $C = 7\pi$
Circumference: 37.68 in	Circumference: 43.96 cm	Circumference: 21.98 m

Use your knowledge of circumference and circles to answer question 1.

1. A Ferris wheel travels in a circular motion and measures 40 meters from the top car to the bottom car.

a. What is the length of the radius of the Ferris wheel? r = 20m

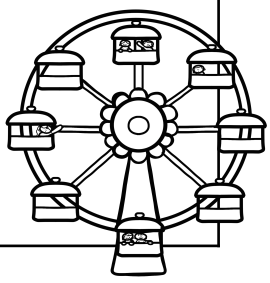
b. What is the length of the diameter of the Ferris wheel? d = 40m

c. A car travels one time around the Ferris wheel. How many meters did the car travel?

The car travels 125.6 m around the Ferris wheel.

d. On another Ferris wheel, a car will travel 100.48 meters to go once around the wheel. What is the height from the top car to the bottom car?

The Ferris wheel has a diameter of 32m.



Summarize today's lesson:

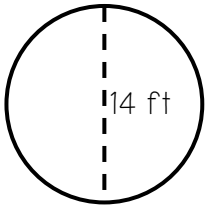
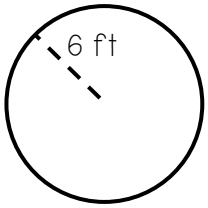
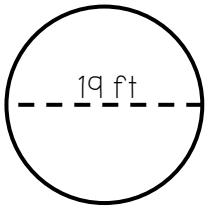
Unit: Plane Geometry & Similarity
Homework 1

Name _____

Date _____ Pd_____

CIRCUMFERENCE OF A CIRCLE

Draw a line connecting each circle to the appropriate radius, diameter, and circumference.

CIRCLE	RADIUS	DIAMETER	CIRCUMFERENCE
1. 	4 feet	12 feet	59.66 feet
	6 feet	15 feet	34.54 feet
2. 	7.5 feet	19 feet	15.7 feet
	9.5 feet	22 feet	28.26 feet
	8 feet	16 feet	37.68 feet
3. 	7 feet	14 feet	43.96 feet
	10.5 feet	11 feet	18.84 feet

Use your understanding of circumference to answer the questions below.

4. An electric toy train travels around a Christmas tree in a circle. The train track measures 6 feet in diameter. What is the distance that the train travels?

18.84 ft

5. A tree is sold based on the circumference of its trunk. If a tree trunk has a radius of 4 inches, then what is the circumference of the tree trunk?

25.12 in

6. Erin runs laps around a circular pond with a radius of 12 yards. She calculated the total distance she would run after ten laps around the pond. Is Erin's calculation correct? If not, correct her work.

No, Erin used the radius in the formula $c = \pi d$.
$(2)(3.14)(12)(10) = 753.6$ yards

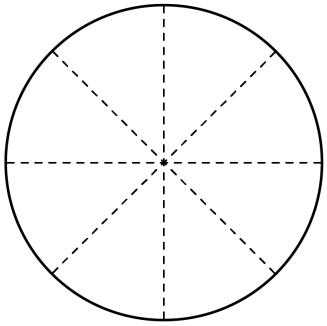
$C = (3.14)(12)(10)$
$C = 37.68\ (10)$
$C = 376.8$ yards

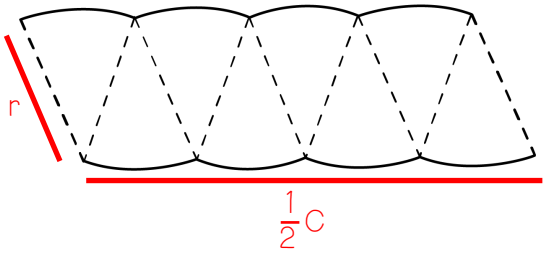
Unit: Plane Geometry & Similarity
Student Handout 2

Name _____
Date _____ Pd _____

AREA OF A CIRCLE

Professor Smart is teaching her students how the formula for the area of a circle was derived. She cuts a circle into equal pieces and rearranges them below.





$A = \frac{1}{2}C \cdot r$

$A = \frac{1}{2}2\pi r \cdot r$

$A = \pi r^2$

a. What general 2D figure do you see when the pieces are rearranged? What is the formula for the area of that shape?

parallelogram; A = bh

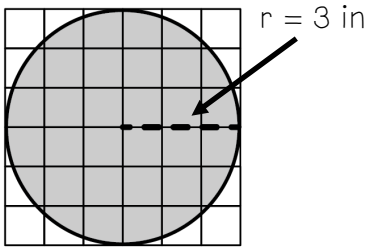
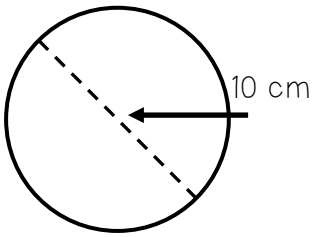
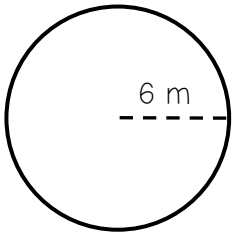
b. Based on the diagram above, how is the circumference of the circle related to the length of the parallelogram?

The length of the base of the parallelogram is equal to half of the circumference.

AREA OF A CIRCLE

- Area is the surface measurement of a two-dimensional figure. It is the _____square units_____ that cover a circle.
- Use the formula _____$A = \pi r^2$_____, where r^2 is equal to _____$r \cdot r$_____.

Using the diameter and radii given below, find the area of the circles.

CIRCLE 1	CIRCLE 2	CIRCLE 3
		
Formula: $A = \pi r^2$	Formula: $A = \pi r^2$	Formula: $A = \pi r^2$
Plug in Values: $A = 3.14(3^2)$	Plug in Values: $A = 3.14(5^2)$	Plug in Values: $A = 3.14(6^2)$
In terms of π: $A = 9\pi$	In terms of π: $A = 25\pi$	In terms of π: $A = 36\pi$
Area: $A = 28.26\ in^2$	Area: $A = 78.5\ cm^2$	Area: $A = 113.04\ m^2$

Use your understanding of the area of circles to answer the following questions.

1. A circle has an area of 78.5 square inches. What is the radius of the circle?

$A = \pi r^2$
$78.5 = 3.14r^2$
$25 = r^2$
$5 \text{ in} = r$

2. A circular sprinkler system is installed and waters an area of 28.26 yards^2. What is the radius of the circle?

$A = \pi r^2$
$28.26 = 3.14r^2$
$9 = r^2$
$3 \text{ yds} = r$

3. Jada says that if you are given the circumference of a circle, you have enough information to find the area of the circle. Is Jada correct? Why or why not?

Ex: Jada is correct. To find area, you need the radius. If you are given the circumference, you can work backwards to determine the radius.

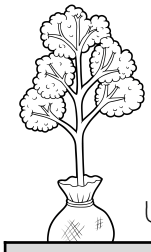
4. Determine whether area or circumference is described by each statement below.

a. The amount of fencing around a circular garden. area or **circumference**

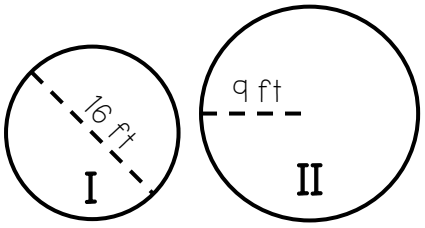
b. The amount of frosting needed to cover a cookie. **area** or circumference

c. The amount of crust needed to cover a pie. **area** or circumference

d. The distance traveled in one lap around a circular track. area or **circumference**



Use the image at the right to answer the question below.



5. Two different trees are being planted in an outdoor garden. Each tree requires a specific amount of space for the roots to grow. How much more space will tree II require?

I KNOW:
tree I – radius of 8 ft
tree II – radius of 9 ft

I NEED TO KNOW:
How many more square feet will tree II require?

PLAN AND WORK:

Tree I
$A = 3.14(8^2)$
$A = 200.96$

Tree II
$A = 3.14(9^2)$
$A = 254.34$

SOLUTION:

Tree II will cover 53.38 ft^2 more than tree I.

Summarize today's lesson:

Unit: Plane Geometry & Similarity
Homework 2

Name _____

Date _____ Pd_____

AREA OF A CIRCLE

Ben and Luna were asked to find the area of a circle with a diameter of 9 cm. Use their work to answer questions 1-2.

BEN

$A = 3.14 (9^2)$

$A = 3.14 (81)$

$A = 254.34 \text{ cm}^2$

LUNA

$A = 3.14 (4.5^2)$

$A = 3.14 (9)$

$A = 28.26 \text{ cm}^2$

1. Describe Ben's mistake in solving for the area of the circle.

Ben used the diameter instead of the radius.

2. Describe Luna's mistake in solving for the area of the circle.

Luna multiplied (4.5)(2) instead of (4.5)(4.5).

3. After identifying each of the mistakes that Ben and Luna made, find the correct area of the circle. Round your answer to the nearest hundredth.

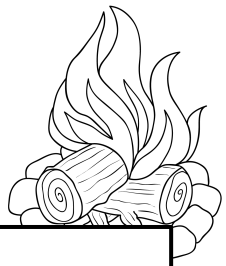
$A = (3.14)(4.5^2)$
$A = 63.59 \text{ cm}^2$

Answer the questions below using your understanding of circles.

4. Place a checkmark by the situations that indicate area.

A. The distance a tire travels in one rotation.

B. The amount of cheese used to cover a pizza. ✓



C. How much space a circular rug takes up. ✓

D. The distance a car travels around a traffic circle.

E. The distance around a campsite fire.

5. A stadium floor that is in the shape of a circle has a diameter of 50 yards. What is the area of the stadium floor?

$A = \pi r^2$
$A = 3.14(25^2)$
$A = 1962.5 \text{ yds}^2$

6. A flower bed surrounds the base of a tree. It is enclosed by stones to form a circle that measure 25.12 feet around. What is the radius of the circle?

$C = 2\pi r$
$25.12 = 2(3.14)r$
$r = 4 \text{ ft}$