Title: Pi Problems for Pi Day (3-14)

Objectives
Students will understand pi and use equations to determine circumference and diameter of circles and cylinders.

Time frame to Complete
45 minutes

NRS EFL
4

Stackable Cert. Documentation	*Technology*	*Study / Life skills*	*EL-Civics*	*Career Pathways*	Police	Paramedic	Fire Rescue	Medical Asst.	EKG / Cardio	Phlebotomy	Practical Nursing	Healthcare Admin	Pharmacy Tech	IMT	AMT	HVAC	Welding	Other:					
x		x																					

Standard(s) Addressed in Lesson
Use Math to Solve Problems and Communicate

Benchmark(s) Addressed in Lesson
M.4.9 Use established formulas to calculate perimeter, circumference, area and volume for basic figures.

Materials
Different size lids, string, rulers, calculators as needed
Formula sheet available from http://www.abcteach.com/directory/basics/math/geometry.
If extra practice is needed, use Circumference and Area of Circles worksheet available from http://www.kutasoftware.com/freeige.html

Learner Prior Knowledge
Basic geometry and understanding of radius, diameter, circumference, and area

Activities
Step 1 Wrap string around the circumference of a circular object. Cut without overlapping.

Step 2 Stretch the string across the diameter of the circular object and cut. Repeat until there is no more string.

Step 3 There should be three pieces of equal length with a little left over. This shows that the circumference is a little more than 3 times the diameter.

Step 4 Try with different size objects. Student should be able to predict (estimate) the circumference of a circle if he/she knows the diameter.

Step 5 Use formulas to find exact measurements. Use handout for extra practice.

Assessment/Evidence
Completed worksheet. Save in folder if using as documentation for Basic Stackable Certificate.

Adaptations for Beginning Students
Beginning students can work with partners. Beginning students won't do handout.

Adaptations for Advanced Students

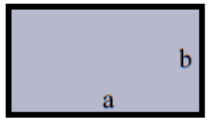
Advanced students describe how this information can be used in their daily lives such as determining how much edging will be needed for a circular garden, determining the area a dog can run on a ten foot chain on a stake, etc. Advanced students will do handout.

Teacher Reflection/Lesson Evaluation

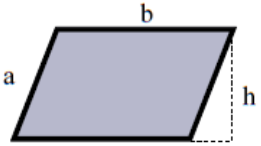
This lesson was created by Middletown ABLE.

Volumes and Areas

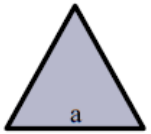
AREA



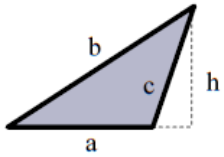
Rectangle
Perimeter = 2a + 2b
Area = a x b



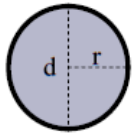
Parallelogram
Perimeter = 2a + 2b
Area = b x h



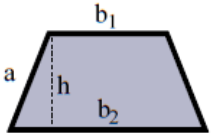
Equilateral Triangle
Perimeter = 3a
Area = (1/4) (Ö3) a^2



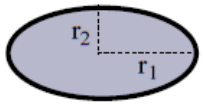
Triangle
Perimeter = a + b + c
Area = (a x h) / 2



Circle
Circumference = 2 x p x r
Area = p r^2

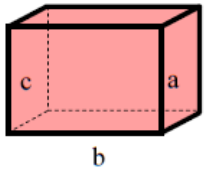


Trapezoid
Perimeter = 2a + b_1 + b_2
Area = h/2 (b_1 + b_2)

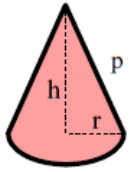


Ellipse
Area = p r_1 r_2

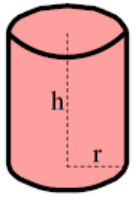
VOLUME



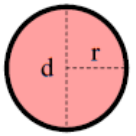
Rectangular Block
Volume = a x b x c
Surface Area = 2(a x b)+2(c x b)+2(a x c)



Cone
Volume = 1/3 p r^2 x h
Surface Area = p x r x (r + (r^2 + h^2)$^{1/2}$)



Cylinder
Volume = p r^2h
Surface Area = (r x h) + 2 (p r^2)



Sphere
Volume = (4/3) p r^3
Surface Area = 4 p r^2

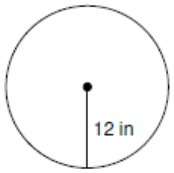
Kuta Software - Infinite Geometry Name_____

Circumference and Area of Circles

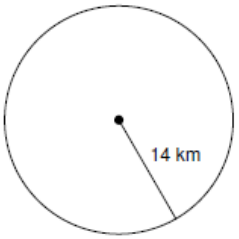
Date_____ Period____

Find the area of each. Use your calculator's value of π. Round your answer to the nearest tenth.

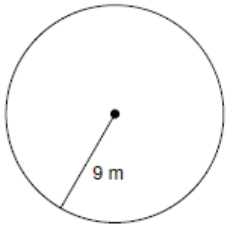
1)



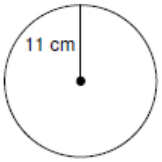
2)



3)



4)



5) radius = 2.6 in

6) radius = 34.1 in

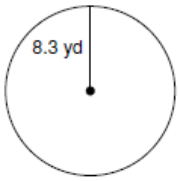
7) radius = 13.2 km

8) radius = 29.9 km

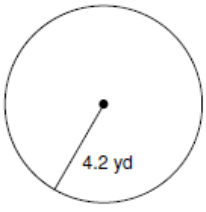
Find the circumference of each circle. Use your calculator's value of π. Round your answer to the nearest tenth.

9)

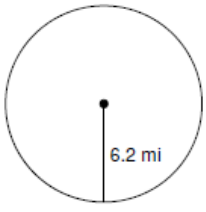
10)



11)



12)



13) radius = 5.2 ft

14) radius = 11.1 ft

15) radius = 9.5 in

16) radius = 9.3 in

Find the radius of each circle. Use your calculator's value of π. Round your answer to the nearest tenth.

17) circumference = 62.8 mi

18) circumference = 69.1 yd

19) circumference = 12.6 yd

20) circumference = 25.1 ft

Find the diameter of each circle. Use your calculator's value of π. Round your answer to the nearest tenth.

21) area = 201.1 in^2

22) area = 78.5 ft^2

23) area = 254.5 in^2

24) area = 314.2 in^2

Find the circumference of each circle.

25) area = 64π mi^2

26) area = 16π in^2

Find the area of each.

27) circumference = 6π yd

28) circumference = 22π in

Critical thinking question:

29) Find the radius of a circle so that its area and circumference have the same value.

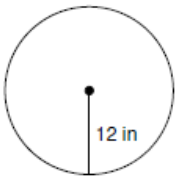
Kuta Software - Infinite Geometry Name_____

Circumference and Area of Circles

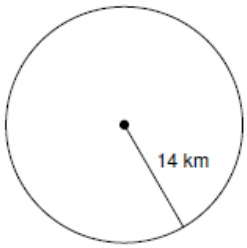
Date_____ Period____

Find the area of each. Use your calculator's value of π. Round your answer to the nearest tenth.

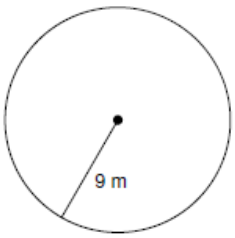
1) 452.4 in²



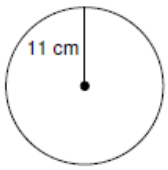
2) 615.8 km²



3) 254.5 m²



4) 380.1 cm²



5) radius = 2.6 in

21.2 in²

6) radius = 34.1 in

3653.1 in²

7) radius = 13.2 km

547.4 km²

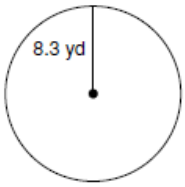
8) radius = 29.9 km

2808.6 km²

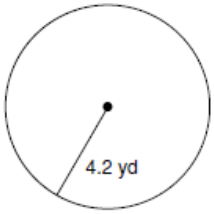
Find the circumference of each circle. Use your calculator's value of π. Round your answer to the nearest tenth.

9) 50.3 mi

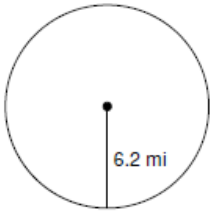
10) 52.2 yd



11) 26.4 yd



12) 39 mi



13) radius = 5.2 ft

32.7 ft

14) radius = 11.1 ft

69.7 ft

15) radius = 9.5 in

59.7 in

16) radius = 9.3 in

58.4 in

Find the radius of each circle. Use your calculator's value of π. Round your answer to the nearest tenth.

17) circumference = 62.8 mi

10 mi

18) circumference = 69.1 yd

11 yd

19) circumference = 12.6 yd

2 yd

20) circumference = 25.1 ft

4 ft

Find the diameter of each circle. Use your calculator's value of π. Round your answer to the nearest tenth.

21) area = 201.1 in^2

16 in

22) area = 78.5 ft^2

10 ft

23) area = 254.5 in^2

18 in

24) area = 314.2 in^2

20 in

Find the circumference of each circle.

25) area = 64π mi^2

16π mi

26) area = 16π in^2

8π in

Find the area of each.

27) circumference = 6π yd

9π yd^2

28) circumference = 22π in

121π in^2

Critical thinking question:

29) Find the radius of a circle so that its area and circumference have the same value.

$r = 2$