

# The Value of Pi

## Purpose

Students will practice using the value of pi as 3.14 and  $\frac{22}{7}$ , compare these values, and decide which measure and result is more appropriate when working with circumference of a circle.

## Materials

*For the teacher:* copy of Black Line Master (BLM) *The Value of Pi*, chalkboard, chalk

*For the student:* pencil, copy of BLM *The Value of Pi*

## Activity

### A. Introduction

1. Tell students there is a special ratio associated with circles. Explain that this ratio is called *pi* and that pi has its own symbol,  $\pi$ . Draw the symbol " $\pi$ " on the board.
2. Explain to students that pi represents the ratio of the diameter of a circle to its circumference. Explain that the circumference of a circle is the distance around the circle.
3. Tell students that pi is an irrational number. Say: "Irrational numbers are numbers with an infinite (non-ending) number of decimal places. To make our computations easier, we generally use either 3.14 or  $\frac{22}{7}$  for the approximate value of pi."
4. Write the formula for area and circumference of a circle on the board ( $A = \pi \times r \times r$  and  $C = \pi \times d$ ).

### B. Individual Activity

1. Distribute one copy of the BLM *The Value of Pi* to each student.
2. Ask students to use the two formulas on the board to compute areas and circumferences of circles.
3. Remind students to express area in square units.
4. Allow time for students to complete the BLM and then discuss the results with the class.



INCORPORATING

## TECHNOLOGY

Have students visit [www.cecm.sfu.ca/pi/pi.html](http://www.cecm.sfu.ca/pi/pi.html). Here they will find the history of pi and an interactive program that lists the 6.4 billion known digits of pi. Give students five minutes to copy down as many digits as they can. Use the data to estimate how long it would take to copy all 6.4 billion known digits.



connecting  
across the  
curriculum

## English/ Language Arts

Have students work in teams to research and write reports on the history of pi. Instruct them to prepare a poster of their findings and share their information with the rest of the class.


Standards Link  
6.5.1


## Classroom Assessment


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### Basic Concepts and Processes

During the activity and when reviewing the BLM, discuss the following questions with your students to gauge their understanding of the Standard Indicators:

 What is the fractional value commonly used for pi?

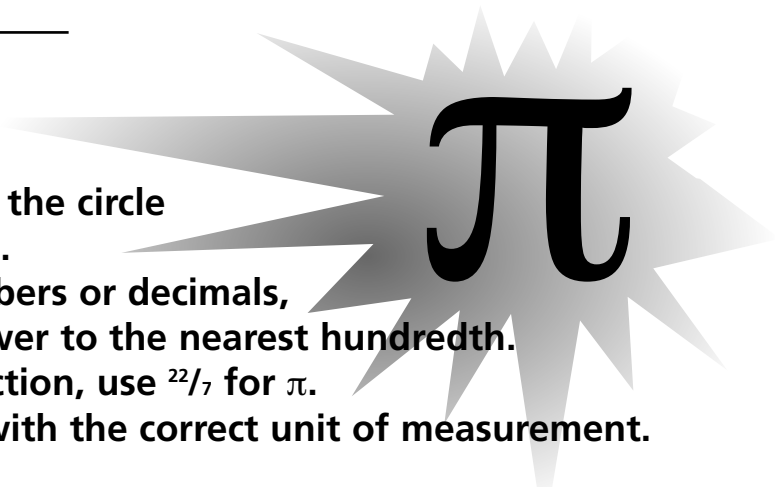
 What is the decimal value commonly used for pi?

 How can you find the circumference of the circle if you have only the radius measurement?

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Name: \_\_\_\_\_

# The Value of Pi



Find the circumference and area of the circle according to the given information.

If the information is in whole numbers or decimals, use 3.14 for  $\pi$  and round your answer to the nearest hundredth.

If the information is given as a fraction, use  $\frac{22}{7}$  for  $\pi$ .

Remember to label your answers with the correct unit of measurement.

1. radius = 4 in

C = \_\_\_\_\_  
A = \_\_\_\_\_

2. radius = 3.15 ft

C = \_\_\_\_\_  
A = \_\_\_\_\_

3. diameter = 3 mi

C = \_\_\_\_\_  
A = \_\_\_\_\_

4. radius =  $2\frac{1}{3}$  ft

C = \_\_\_\_\_  
A = \_\_\_\_\_

5. diameter = 0.66 in

C = \_\_\_\_\_  
A = \_\_\_\_\_

6. radius =  $\frac{3}{4}$  mi

C = \_\_\_\_\_  
A = \_\_\_\_\_

7. radius = 6 m

C = \_\_\_\_\_  
A = \_\_\_\_\_

8. diameter = 10.3 m

C = \_\_\_\_\_  
A = \_\_\_\_\_

9. radius = 100 km

C = \_\_\_\_\_  
A = \_\_\_\_\_

10. radius = 1.25 yd

C = \_\_\_\_\_  
A = \_\_\_\_\_

11. diameter =  $2\frac{1}{2}$  m

C = \_\_\_\_\_  
A = \_\_\_\_\_

12. radius = 25.5 mi

C = \_\_\_\_\_  
A = \_\_\_\_\_

13. The circumference of a circle is 65.94 ft; compute the measure of its diameter. \_\_\_\_\_

14. The area of a circle is  $78.5 \text{ m}^2$ ; compute the measure of its radius. \_\_\_\_\_

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## Teacher Directions

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Give one copy of the BLM *The Value of Pi* to each student. Read instructions together in class, and tell students to use the formulas for circumference and area to solve the problems.

Have students check their answers by estimating using 3 for the value of pi.

## Answer Key

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Answers may vary slightly according to which step students round their answers.

1. 25.12 in, 50.24 in<sup>2</sup>
2. 19.78 ft, 31.16 ft<sup>2</sup>
3. 9.42 mi, 7.07 mi<sup>2</sup>
4.  $\frac{44}{3}$  or  $14\frac{2}{3}$  ft,  $\frac{154}{9}$  or  $17\frac{1}{9}$  ft<sup>2</sup>
5. 2.07 in, 0.34 in<sup>2</sup>
6.  $\frac{33}{7}$  or  $4\frac{5}{7}$  mi,  $\frac{99}{56}$  or  $1\frac{43}{56}$  mi<sup>2</sup>
7. 37.68 m, 113.04 m<sup>2</sup>
8. 32.34 m, 83.28 m<sup>2</sup>
9. 628 km, 31,400 km<sup>2</sup>
10. 7.85 yd, 4.91 yd<sup>2</sup>
11.  $\frac{55}{7}$  or  $7\frac{6}{7}$  m,  $\frac{275}{56}$  or  $4\frac{51}{56}$  m<sup>2</sup>
12. 160.14 mi, 2,041.79 mi<sup>2</sup>
13. 21 ft
14. 5 m