Join Glencoe Mathematics in Celebration of the 300th Anniversary of π in 2006!

Begin Your Celebration on Pi Day, March 14.

A Slice of π

π as the symbol for the constant 3.1415192653… was first used by mathematician William Jones in 1706.

However, estimates for pi go back to antiquity with virtually every culture making their own discoveries.

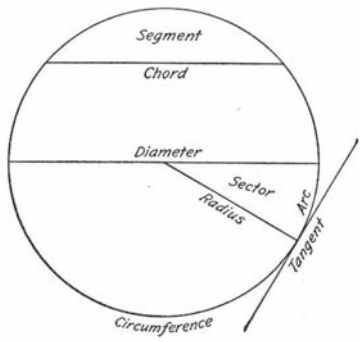
The Egyptians used 3.16 over 3,000 years ago. One Biblical passage from the Book of Kings suggests that the Hebrews may have used 3 as the value for pi. Chinese mathematicians of the 3rd century A.D. calculated pi to be 3.140. Three centuries later an Indian mathematician used 3.1416, while Iranian mathematicians in the 15th century computed the value of pi accurately to over eight digits.

But it was William Jones in 1706 who first used π to represent the constant, and we have been using the symbol ever since.

Today, the value of π has been accurately calculated to over one trillion digits!

Of course, we have known for a long time that the true value of pi can never be found. We can only continue to obtain a better estimate using more powerful computers programmed with more efficient algorithms.

Activities from Glencoe Mathematics



Engage your students in making their own π discoveries with the following activities selected from Glencoe's Grades 6 through 12 Mathematics Programs.

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PI ACTIVITY 1 : Grades 6 - 8

Ms. Marrero is a math teacher who wants to celebrate pi day by buying pies for her class. (Pi day is March 14 or 3.14.) She has 27 students in the class. How much pie will each student get if she buys each of the following number of pies?

A. 3 pies

B. 5 pies

C. 9 pies

D. 30 pies

(SOURCE: Glencoe *MathScape Course 1* ©2005 page. 159. Copies of this activity may be made for classroom use only.)

PI ACTIVITY 2: Grades 6 – 10 (Graph paper version)

The area of a circle with radius *r* is given by the formula $A = \pi r^2$.

A. Make a table of values for A as r increases from 0 to 10 units.

B. Plot the values on a graph with *r* on the horizontal axis and A on the vertical axis. Connect the points with a smooth curve.

C. The areas of three circles are given. Use your graph to find an approximate value for the radius of each circle.

i. 25 square units

ii. 100 square units

iii. 300 square units

D. Check your results by substituting each radius into the area formula.

E. Use a graphing calculator instead of graphing paper to complete this activity.

(SOURCE: Glencoe *IMPACT, Course 3*© 2005, page 78. Copies of this activity may be made for classroom use only.)

PI ACTIVITY 3: Grades 6 – 10 (Graphing calculator version of Activity 2)

The area of a circle with radius *r* is given by the formula $A = \pi r^2$.

A. Make a table of values for A as r increases from 0 to 10 units.

B. Plot the values on a graph with *r* on the horizontal axis and A on the vertical axis. Connect the points with a smooth curve.

C. The areas of three circles are given. Use your graph to find an approximate value for the radius of each circle.

i. 25 square units

ii. 100 square units

iii. 300 square units

D. Check your results by substituting each radius into the area formula.

E. Use a graphing calculator instead of graphing paper to complete this activity.

(SOURCE: Glencoe *IMPACT, Course 3*© 2005, page 78. Copies of this activity may be made for classroom use only.)

PI ACTIVITY 4: Grades 9 -12

Locate six cylindrical shapes of different sizes. Cans and jars work well.

A. Measure the circumference of each cylinder to the nearest 0.1 cm. Record your data in a table.

B. On a sheet of paper, trace around the base of each cylinder. Then measure, to the nearest 0.1 cm, the diameter of each tracing and record it in your table.

C. Make a plot of your (diameter, circumference) data.

D. Find a line and its equation that you believe models the trend in these data.

-- What is the slope of the line? What does it mean?

-- What is the y-intercept? Does it make sense? Explain.

E. The diameter of a small fruit-juice can is approximately 5.5 cm. Use your linear model to predict the circumference of the can.

F. Compare your predicted circumference to that computed by using the formula for the circumference of a circle. Explain and differences.

(SOURCE: Glencoe *Contemporary Mathematics in Context, Course 1, Part B* © 2003, pages 369-370. Copies of this activity may be made for classroom use only.)

PI ACTIVITY 5: Grades 6 – 8

The value of pi (π) is 3.1415927… . Pi is a nonrepeating, nonterminating decimal. Mathematicians have used many methods to find the value of π.

1. **Archimedes believed that π was between $3\frac{1}{7}$ and $3\frac{10}{71}$. Write each fraction as a decimal rounded to the nearest hundred-thousandth. Was Archimedes correct?**
2. **The Rhind Papyrus states that the Egyptians used $\frac{256}{81}$ for π. Write the fraction as a decimal rounded to the nearest hundred-thousandth. Which is closer to the actual value of π, Archimedes' value or the Egyptians' value?**

(SOURCE: Glencoe Mathematics: Applications and Concepts, Course 2, ©2006 p. 213. Copies of this activity may be made for classroom use only.)