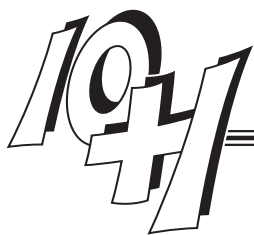


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Activity 8 - Finding π

Materials Required:

Student activity 8 - 2 pages (1 copy per student)
Scientific calculator

Time Requirement:

One class period of 45 minutes or longer

Math Concepts Applied:

Geometric figures
Trigonometry
Taylor series

Teacher Information:

Although students regularly use an approximation for π in determining the area and perimeter of circles, they may not be familiar with a chronology of π . Therefore, this activity can serve as an introduction to a few of the techniques that have been used to compute π .

A. Archimedes' Method

1 & 2) Completed.

3)
$$\text{Perimeter} = 24 \cdot \sin \frac{15^\circ}{2} \approx 3.133$$

4) $6 \cdot 2^3$ sides gives a perimeter of 3.14

5) Using an inductive argument should enable students to arrive at this result.

B.

1) $\pi \approx 3.002$

2) ≈ 3.042

3)
$$\tan^{-1}\left(\frac{1}{5}\right) = \frac{1}{5} - \frac{(1/5)^3}{3} + \frac{(1/5)^5}{5} - \frac{(1/5)^7}{7} \approx .197396$$

$$\tan^{-1}\left(\frac{1}{239}\right) = \frac{1}{239} - \frac{(1/239)^3}{3} + \frac{(1/239)^5}{5} - \frac{(1/239)^7}{7} \approx .004184$$

$$\frac{\pi}{4} \approx 4(.197396) - .004184 = 3.1416$$