

MATH 242 — 8 Sept. 2025

Example: Homework: 82%
Projects: 2E, 3M
Final: E
Challenge: 2 M

B
B
A
B } B⁺

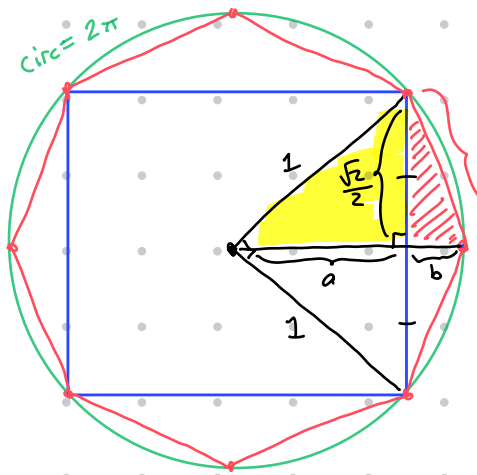
Example: Homework: 92%
Projects: 2E, 3M
Final: E
Challenge: 4 M

A
B
A
A } A⁻

How does Archimedes's method approximate π ?

What picture can you draw to illustrate the method?

What questions do you have?



Square: $4 = 2^2$ -gon

Side length: $S_2 = \sqrt{2}$

approx. $\pi_2^i = \frac{4\sqrt{2}}{2} = 2\sqrt{2} \approx 2.82...$

Octagon: 2^3 -gon

$$a = \sqrt{1^2 - \left(\frac{\sqrt{2}}{2}\right)^2} = \frac{1}{\sqrt{2}}$$

$$b = 1 - a = 1 - \frac{1}{\sqrt{2}}$$

$$S_3 = \sqrt{b^2 + \left(\frac{\sqrt{2}}{2}\right)^2} = \sqrt{2 - \sqrt{2}}$$

$$\text{approx. } \pi_3^i = \frac{8S_3}{2} = 4\sqrt{2 - \sqrt{2}} \approx 3.06...$$