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//!!!
///((sin((((360/8128)/2)/128).degrad)*2)*(8128*128))/2
//pi approximation (archimedean) via perfect numbers "polygons" 6,28,496,8128

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*///Chat GPT was used for making the bellow graph and extending the supercollider function above to a mathematical formula.*

N (perfect number)	π approx	Error
6	3.0	$1.416 \times 10^{-1}$
28	3.1416	$7 \times 10^{-6}$
496	3.14159292	$2.9 \times 10^{-7}$
8128	3.141592653589	$\sim 10^{-12}$

Perfect numbers (first four):

$$6, 28, 496, 8128$$

The formula:

$$\pi_{\text{approx}} = \frac{N \cdot s}{2}, \quad s = 2 \sin\left(\frac{180^\circ}{N}\right)$$

We'll compute each.

a)  $N = 6$

$$s = 2 \sin(180/6) = 2 \sin(30^\circ) = 1$$

$$\pi_{\text{approx}} = \frac{6 \cdot 1}{2} = 3.0$$

Error:

$$\pi - 3.0 \approx 0.1415927$$

