Right triangle in which the sum of the legs is close to Pi.

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Abstract

Using elementary geometry, we have performed an approach to Pi value. This agrees to the fifth decimal place.

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Method and result.

First we make the triangle depicted in figure 1:

Cathetus $A = 1$

Cathetus $B = \frac{\sqrt{2}}{2}$

Hypotenuse $C = \sqrt{1 + \frac{1}{2}}$
Now we perform the following operations:

\[ j = \frac{1}{\sqrt{1 + \frac{1}{2}}} \]

\[ g = j \sqrt{2} \]

\[ g + j = \frac{1 + \sqrt{2}}{\sqrt{1 + \frac{1}{2}}} \]

Figure 2. values \( g \) and \( j \).

And now we will write the approximation to Pi:

\[ \Pi \approx (g + j) 1 + \frac{1}{2} + \frac{1}{16} + \frac{1}{32} \]

which is correct to five decimal places of Pi.
Figure 3. shows several ways to depict graphically the number Pi as described above.