This paper introduces many formulas for π and specifically introduces a probabilistic proof of Wallis's formula for π.

$$\frac{\pi}{2} = \frac{2 \cdot 2}{1 \cdot 3}\frac{4 \cdot 4}{3 \cdot 5}\frac{6 \cdot 6}{5 \cdot 7}\frac{8 \cdot 8}{7 \cdot 9} \cdots \tag{0.1}$$

The author argues directly and gives a "mostly elementary" proof to the theorem. The first important concept is that every nonnegative continuous function whose integral is finite can be changed into a continuous probability distribution. The proof also relies on two standard functions from probability: the Gamma function and the Student *t*-distribution. The author makes two claims from each of these two functions. The first claim is that

$$\Gamma(1/2) = \sqrt{\pi}. \tag{0.2}$$

By using the definition of the Gamma function and a change of coordinates the author is able to prove this claim. The second claim is that the Student *t*-distribution is a continuous probability density. Also central limit theorem is also mentioned to prove these claims. Then the author uses these two claims and several basic facts about the Gamma function to prove the Wallis's formula for π.