

random tests

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Bhaskara's formula

$$\sin \theta^\circ \approx \frac{4\theta(180 - \theta)}{40500 - \theta(180 - \theta)}, \text{ for } 0 \leq \theta \leq 180$$

Harshad numbers

$$\frac{6174}{6 + 1 + 7 + 4} = \frac{6174}{18} = 343$$

Sine of 1,234,567,890 degrees

$$\sin(1, 234, 567, 890^\circ) = 1$$

This is the probability that if 3 integers are chosen at random, no common factor will divide them all

$$\frac{1}{\zeta(3)} = \frac{1}{\frac{1}{1^3} + \frac{1}{2^3} + \frac{1}{3^3} + \frac{1}{4^3} + \cdots} \approx 83\%$$

Mega Millions

$$\begin{aligned}
\binom{70}{5} &= \frac{70!}{(70-5)!5!} \\
&= \frac{70 \cdot 69 \cdot 68 \cdot 67 \cdot 66 \cdot 65!}{65!5!} \\
&= \frac{70 \cdot 69 \cdot 68 \cdot 67 \cdot 66}{5!} \\
&= \frac{1,452,361,680}{120} \\
&= 12,103,014
\end{aligned}$$

$$\begin{aligned}
\# \binom{n}{k} &= \frac{n!}{(n-k)!k!} \\
\# 70! &= 70 \cdot 69 \cdot 68 \cdot 67 \cdot 66 \cdot 65! \\
\# \text{ cancel } 65! & \\
\# 5! &= 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120 \\
\# \binom{70}{5} &= 12,103,014
\end{aligned}$$

Schrödinger equation

$$H(t) |\psi(t)\rangle = i\hbar \frac{\partial}{\partial t} |\psi(t)\rangle$$

The Spiral of Theodorus

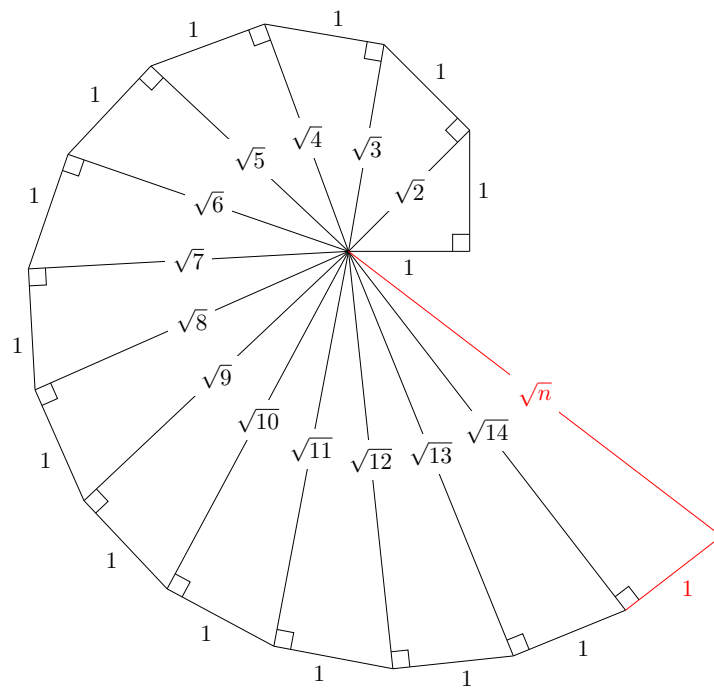


Figure 1: The Spiral of Theodorus

Acknowledgements

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