random tests

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Last update: August 16, 2022

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

$$\binom{70}{5} \;=\; \frac{70!}{(70-5)!\,5!} \qquad\qquad \#\; \binom{n}{k} = \frac{n!}{(n-k)!\,k!}$$

$$=\; \frac{70\cdot 69\cdot 68\cdot 67\cdot 66\cdot 65!}{65!\,5!} \qquad\qquad \#\; 70! = 70\cdot 69\cdot 68\cdot 67\cdot 66\cdot 65!$$

$$=\; \frac{70\cdot 69\cdot 68\cdot 67\cdot 66}{5!} \qquad\qquad \#\; \text{cancel } 65!$$

$$=\; \frac{1,452,361,680}{120} \qquad\qquad \#\; 5! = 5\cdot 4\cdot 3\cdot 2\cdot 1 = 120$$

$$=\; 12,103,014 \qquad\qquad \#\; \binom{70}{5} = 12,103,014$$

Schrödinger equation

$$H(t)\,|\,\psi(t)\rangle = i\hbar\,\frac{\partial}{\partial t}\,|\,\psi(t)\rangle$$
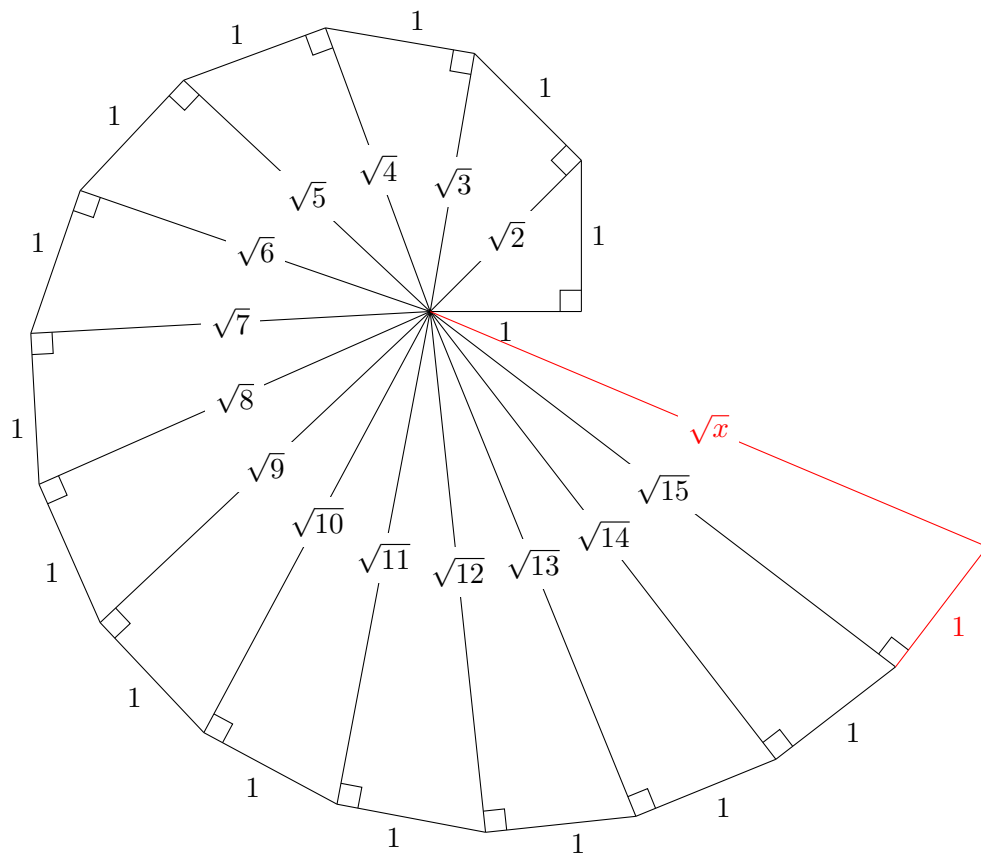
Figure 1: The Spiral of Theodorus up to $\sqrt{15}$

Acknowledgements

LaTeX Source