

# **FORMULAS**

'The laws of nature are but the mathematical thoughts of God.'
Euclid

FORMULA No.

**W46** 

www.and-just-math.com

We are not mathematicians, but we love mathematics and create formulas ourselves.

'No other science boosts the faith in the strength of the human spirit like mathematics.' Hugo Steinhaus

# 1 WEEK = 7 DAYS 7 FORMULAS



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$$k \in N$$

$$\sum_{k=1}^{k=\infty} \frac{k! \times (k^2 + k + 1) + 4 \times (-1)^k}{[k \times k! - 2 \times (-1)^k] \times [(k+1) \times (k+1)! - 2 \times (-1)^{k+1}]} = \frac{1}{3}$$



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$$\sum_{k=1}^{k=\infty} \frac{(k^2 + 2 \times k + 5) \times 2^{2 \times k + 1}}{k \times (k + 1) \times (k + 5)!} = \frac{1}{15}$$



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$$\sum_{k=1}^{k=\infty} \frac{\sin\left(\frac{(2\times k-1)\times \pi}{2^{k+2}\times k!}\right)}{\cos\left(\frac{\pi}{2^{k+2}\times k!}\right)\times\cos\left(\frac{\pi}{2^{k+1}\times (k-1)!}\right)} = 1$$



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$$k \in N$$

$$\sum_{k=1}^{k=\infty} \sin\left(\frac{k\times\pi}{8\times(k+1)!}\right)\times\cos\left(\frac{(k+2)\times\pi}{8\times(k+1)!}\right) = \frac{\sqrt{2}}{4}$$



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$$\sum_{k=1}^{k=\infty} \frac{2^{k-1} + k \times 2^{k-2} + 1}{k \times (k+1) \times (2^{k-2} + 1) \times (2^{k-1} + 1)} = \frac{2}{3}$$



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$$\sum_{k=1}^{k=\infty} \frac{\sin\left(\frac{5 \times \pi}{12 \times k \times (k+1)}\right)}{\sin\left(\frac{(6 \times k+1) \times \pi}{12 \times (k+1)}\right) \times \sin\left(\frac{(6 \times k+5) \times \pi}{12 \times k}\right)}$$

$$= 2 + \sqrt{3}$$



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$$\sum_{k=1}^{k=\infty} \frac{k^3 + 7 \times k^2 + 13 \times k + 5}{(k+1)! \times (k+4)!} = \frac{3}{4!}$$

