FORMULAS

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

FORMULA No.

W37

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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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$$k \in N$$

$$\sum_{k=1}^{k=\infty} sin\left(\frac{3 \times \pi}{2^{2 \times k+1}}\right) \times sin\left(\frac{9 \times \pi}{5 \times 2^{2 \times k+1}}\right) = \frac{3+\sqrt{5}}{8}$$

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$$k \in N$$

$$\sum_{k=1}^{k=\infty} \frac{k^3}{[k^2 \times (k+1)^2 + 4] \times [k^2 \times (k-1)^2 + 4]} = \frac{1}{16}$$

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$$k \in N$$

$$\sum_{k=1}^{k=\infty} arc\,tg\left(\frac{5 \times (\sqrt{25 - 10 \times \sqrt{5}}) \times 2^{k-1}}{(2^{k-1} - 1) \times (2^{k} - 1) \times \left(25 - 10 \times \sqrt{5}\right) + 25 \times 2^{2 \times k - 1}}\right) = \frac{\pi}{10}$$

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$$k \in N$$

$$\sum_{k=1}^{k=\infty} \frac{k \times \sqrt{3 \times k^2 + 6 \times k + 4} - (k+1) \times \sqrt{3 \times k^2 + 1} + 1}{k \times (k+1)} = \sqrt{3} - 1$$

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$$\sum_{k=1}^{k=\infty} arc\ sin\left(\frac{\sqrt{4\times k^4+1}}{4\times k^4+1}\right) = \frac{\pi}{4} \qquad k \in N$$

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$$\sum_{k=1}^{k=\infty} (-1)^{k-1} \times sin\left(\frac{\pi}{4 \times 3^{k+1}}\right) \times cos\left(\frac{\pi}{8 \times 3^{k+1}}\right) = \qquad k \in N$$

$$= \frac{\left(\sqrt{2}+\sqrt{6}-2\right) \times \sqrt{8+2 \times \sqrt{6}-4 \times \sqrt{2}-4 \times \sqrt{3}}}{16}$$

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$$k \in N$$

$$\prod_{k=1}^{k=\infty} \cos\left(\frac{\pi}{3 \times 2^{2 \times k+2}}\right) \times \cos\left(\frac{\pi}{3 \times 2^{2 \times k+3}}\right) =$$

$$= \frac{3 \times \left(\sqrt{2}+\sqrt{6}-2\right) \times \sqrt{8+2 \times \sqrt{6}-4 \times \sqrt{2}-4 \times \sqrt{3}}}{\pi}$$

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