Unit 988

These two „beautiful“ but slowly converging formulas

$$\sum_{i=1}^{\infty} \frac{3!}{3!*(2i-1)^2-\frac{3}{2}} \qquad (1)$$

$$\prod_{i=1}^{\infty} \frac{3!*n^2}{3!*n^2-\frac{3}{2}} \qquad (2)$$

represent $\frac{\pi}{2}$ (see also [1]).

Problems

P988.**1**

Simplify the equs (1) and (2) as far as possible to basic equs (3) and (4).

P988.**2**

Show: A suitable transform of equ (1/3) leads to equ (2/4) and vice versa.

P988.**3**

Tune these equations for a significant convergence acceleration (see Units 1, 44, 66, 135, 902).

P988.**4**

Find more similar to equs (1) and (2), esp. nested expressions and continued fractions.

Ref.

[1] M. Pauqué. Universal Scaling III raum&zeit 221/2019, 52-57

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