Project Euler.net

Triangular, pentagonal, and hexagonal

`Problem 45`

Triangle, pentagonal, and hexagonal numbers are generated by the following formulae:

Triangle $T_n=n(n+1)/2$ 1, 3, 6, 10, 15, …

Pentagonal $P_n=n(3n-1)/2$ 1, 5, 12, 22, 35, …

Hexagonal $H_n=n(2n-1)$ 1, 6, 15, 28, 45, …

It can be verified that $T_{285} = P_{165} = H_{143} = 40755$.

Find the next triangle number that is also pentagonal and hexagonal.