$S_6 = 55 + 1$

$S_6 = 2 \cdot 28 = 4 \cdot 14 = 7 \cdot 8 = 2 \cdot 2 \cdot 2 \cdot 7 = 2^3 \cdot 7$

Detached number (triangular pyramid)

Abundant $S_6 = \binom{6+2}{3}$

Ways to pick 3 things from 8.

Number of ways to partition eleven elements.

A tetranacci number.

Pronic number - product of consecutive numbers.

Maximum determinant of an $8 \times 8$ matrix containing only 0's and 1's.

Maximum number of regions 10 lines divide a plane

$S_6 = 2^2 + 4^2 + 6^2$ uniquely.

Integers in field $\mathbb{Q}(\sqrt{-56})$ has class number 4.

Number of $5 \times 5$ reduced Latin squares.

Congruent number.