## Fermat's Christmas Theorem

## David Meyer

dmm@{1-4-5.net,uoregon.edu}

Last update: December 26, 2020

Fermat's Christmas Theorem (aka Fermat's theorem on sums of two squares) states that an odd prime number p can be expressed as

$$p = r^2 + s^2$$

where  $r, s \in \mathbb{N}$ , if and only if  $p \equiv 1 \pmod{4}$ .