

Demonstre que se n e m , são somas de dois quadrados perfeitos, então seu produto também é.

Exemplo: $n = 2^2 + 3^2 = 25$
 $m = 4^2 + 7^2 = 65$
 $n.m = 1625 = 29^2 + 28^2$

$$(a^2+b^2). (c^2+d^2) =$$

$$- 2.a.b.c.d + (b.c)^2 =$$

$$(a.d)^2+(b.c)^2 =$$

$$\begin{aligned} \text{tome} \\ n &= a^2 + b^2 \\ m &= c^2 + d^2 \end{aligned}$$

$$\begin{aligned} \text{mas} \\ (a.c + b.d) \\ \in \mathbb{Z} \text{ e} \end{aligned}$$

$$\begin{aligned} \text{para} \\ a,b,c,d \in \mathbb{Z} \end{aligned}$$

$$\begin{aligned} (a.d - b.c) \\ \in \mathbb{Z}, \\ \text{logo} \end{aligned}$$

$$(b.d)^2+(a.d)^2$$

$$\begin{aligned} n.m \text{ é soma} \\ \text{de dois} \\ \text{quadrados} \end{aligned}$$

$$\begin{aligned} (a.c)^2+ (b.d)^2 \\ + \end{aligned}$$

$$\begin{aligned} (a.c)^2 + \\ 2.a.b.c.d + \end{aligned}$$

$$\begin{aligned} \text{então} \\ n.m = \end{aligned}$$

$$\begin{aligned} (a.c + b.d)^2 \\ + \\ (a.d - b.c)^2 \end{aligned}$$



arrasta.o.x@gmail.com
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