

$$x^y \cdot y + y^x \cdot x = n \Rightarrow$$

$$y(x^y + y^{x-1}x) = n$$

$$yx(x^{y-1} + y^{x-1}) = n$$

for $x=1$

$$y(1+1) = n$$

$$2y = n$$

$$y = n/2$$

for $n \% 2 == 0 \nexists n \exists x, y \text{ s.t. } (1, n/2)$

for $n \% 2 \neq 0$;

	x	y	x^{y-1}	y^{x-1}	n
① =	O	O		E	O · O · E = E
② [O	E	dc		O · E · dc = E
	E	O	dc		E
③ =	E	E	dc		E · E · dc = E

O: Odd

E: Even

dc: don't
care

iff $\exists x, y \text{ s.t. } yx(x^{y-1} + y^{x-1}) = n$ iff n is Even.