$X^p - Y^p = A^p B^p$

Has no solution in Natural Numbers for

x,y,z,a,b >0 ; p = odd prime

Proof :

x^p-y^p= a^p*b^p ?

= (x-y)*[x^(p-1)*y^0+x^(p-2)*y^1+x^(p-3)*y^2+…x^0*y^(p-1)]

=>

(x-y) = a^p   is allways possible

⇨ [x^(p-1)*y^0+x^(p-2)*y^1+x^(p-3)*y^2+…x^0*y^(p-1)]= b^p

= [b^(p-1)+b^(p-1)+b^(p-1)…..b^(p-1)]

Possible only if x=y => x^(p-1)=b^p-1) => (x-y) =0

=> No solution for $X^p - Y^p = A^p B^p$

q.e.d

Maik Becker-Sievert