Sarah Magno 9/22/2021

Attendance Quiz 5

Part I.

① Look up a joke based on the Pythagorean Theorem.

Q: Why was Pythagoras not considered a suspect in the murder case?

A: No one knew what his angle was.

② Complete the full proof by hand showing that $(m^2-n^2)^2+(2mn)^2=(m^2+n^2)^2$

Left Hand Side: $(m^4-2m^2n^2+n^4)+(4m^2n^2)$

$$=m^4+2m^2n^2+n^4$$

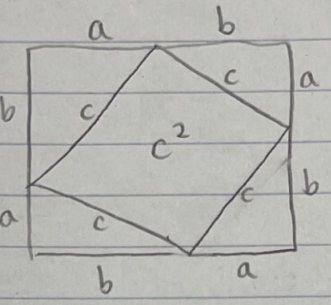
Right Hand Side: $(m^4+2m^2n^2+n^4)$

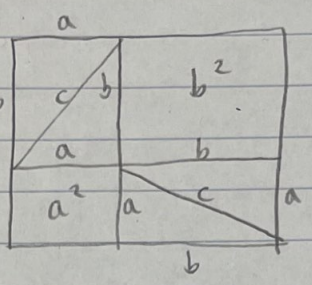
This shows that both sides are equal.

Pythagorean Theorem: $a^2+b^2=c^2$

Part II.

① I.)





$= 4(\frac{1}{2}ab) + c^2$

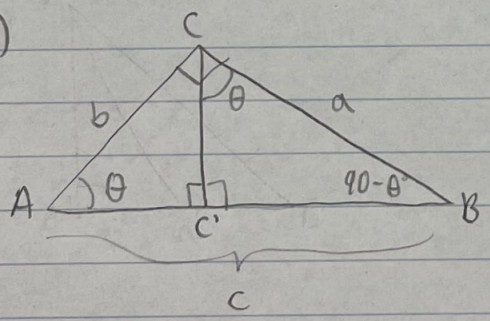
$= c^2 + 2ab$

Area of big square: $(a+b)^2 = a^2+2ab+b^2$

$a^2+2ab+b^2 = c^2+2ab$

$a^2+b^2=c^2$

II.)



ABC, ACC', and BCC' are similar since their angles are the same. Areas are proportional to the squares of the bases, so for some constant m,

$ma^2+mb^2=mc^2$

So $a^2+b^2=c^2$.

② We use $a=m^2-n^2$, $b=2mn$, $c=m^2+n^2$

If $m=2$ and $n=1$, we get $(3,4,5)$

If $m=3$ and $n=1$, we get $(8,6,10)$, however, it's not primitive.

If $m=3$ and $n=2$, we get $(5,12,13)$

If $m=4$ and $n=1$, we get $(15,8,17)$

So the first three smallest Pythagorean triples are

$(3,4,5)$; $(5,12,13)$; and $(8,15,17)$