Sarah Calvin Attendance Quiz 5

1. Give a joke that talks about the Pythagorean theorem
The birth of a right triangle:
"He is too big. We need to perform a $\sqrt{a^2+b^2}$ section."

2. To prove that $(m^2-n^2, 2mn, m^2+n^2)$ is always a Pythagorean triple, we need to show that $(m^2-n^2)^2 + (2mn)^2 = (m^2+n^2)^2$

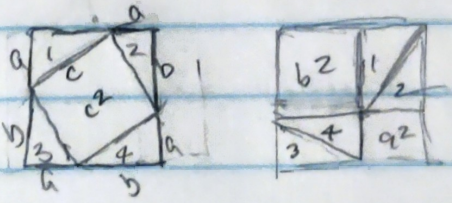
$(m^2-n^2)^2 + (2mn)^2 = (m^2+n^2)^2$

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

$m^4 + 2m^2n^2 + n^4 = m^4 + 2m^2n^2 + n^4$ which is true so therefore for any m, n those would be a Pythagorean triple.

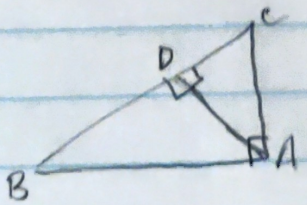
3. The Pythagorean theorem is that the sum of the squares of the two sides is equal to the square of the other side.

- Rearrangement Proof



By rearranging the figure, you get an area that is the same, and the four triangles remain the same. So, it must be that the remaining area in the two figures c^2 and a^2+b^2 must be equal hence getting $c^2 = a^2 + b^2$

- Similar Triangles



The three formed triangles are similar.

$\frac{AC}{CD} = \frac{BC}{AC}$ and $\frac{AB}{BD} = \frac{BC}{AB} \Rightarrow AC^2 = (BC)(CD)$ $\quad AB^2 = (BC)(BD)$

$AC^2 + AB^2 = (BC)(CD) + (BC)(BD) = BC(CD+BD) = BC^2$