1. **Use the Pythagorean Theorem to find s, the slant height of the pyramid.**

   In order to find the slant height, we need to use the Pythagorean Theorem:

$$
\begin{aligned}
(\text{leg } 1)^2 + (\text{leg } 2)^2 &= (\text{hypotenuse})^2 \\
\Rightarrow a^2 + h^2 &= s^2 \\
\Rightarrow (377.88)^2 + (481.40)^2 &= s^2 \\
\Rightarrow 374,539.25 &\approx s^2 \\
\Rightarrow 612.00 &\approx s
\end{aligned}
$$

2. **Find the ratio of the slant height $\boldsymbol{s}$ to half the length of the base, $\boldsymbol{a}$.**

   The ratio of the slant height to half the base is

$$\frac{s}{a} = \frac{612.00}{377.88} \approx 1.61956.$$

3. **Is the ratio $\boldsymbol{\frac{s}{a}}$ within our acceptance range for the Golden Ratio?**

   Since our acceptance range is:

$$1.5533 \leq \text{ ratio } \leq 1.6828,$$

   $\frac{s}{a} \approx 1.61956$ is well within this range.

   In fact, $\frac{s}{a}$ is quite close to the Golden Ratio – much closer than we really have any right to expect it to be, given all the provisos we made earlier. Which leads us to the question...

4. **How Close *is* this to the Golden Ratio?**

We know $\frac{s}{a}$ is well within the 4% margin of error we used for the ratio. Now we want to know... What percent ***is*** it off by?

To calculate what percent of φ the ratio $\frac{s}{a}$ is, we use the same technique you use to calculate what percentage you get on a quiz worth 80 points. In that case, you divide your score by the total. In this case, we divide our *measured* ratio by the *target* ratio.

$$\frac{s/a}{\varphi} = \frac{1.61956}{1.61803} = 1.000946 \Rightarrow \frac{s}{a} = 100.095\%(\varphi).$$

In other words, the ratio of the slant height to half the side is within .1% of the Golden Ratio.

Considering that this is an ancient archeological site, this is *incredibly* close.

So it *seems* the Golden Ratio may well show up in the Great Pyramid.

5. **Find the ratio of the actual height of the pyramid, $\boldsymbol{h}$, to half the length of the base, $\boldsymbol{a}$.**

$$\frac{h}{a} = \frac{481.4}{377.88} \approx 1.27395.$$

6. **Find $\sqrt{\varphi}$.**

$$\sqrt{\varphi} = \sqrt{\frac{1+\sqrt{5}}{2}} \approx 1.27202.$$

7. **How far off is h/a from $\sqrt{\varphi}$?**

$$\frac{h/a}{\sqrt{\varphi}} \approx \frac{1.27395}{1.27202} = 1.001517 \Rightarrow \frac{h}{a} = 100.15\%(\sqrt{\varphi}).$$

Thus the ratio of the height of the pyramid to half the length of the base is within .2% of the square root of the Golden Ratio – still well within most any acceptance ratio.

So now we have two instances that seem to show the Golden Ratio is in the Great Pyramid.