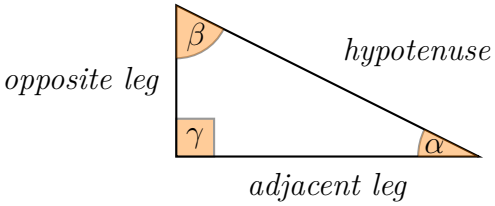
Math 113 Quiz # 5

Instructor: Wenqiang Feng Name: solutions

Using what you have learned answer the following questions. Show all work if you want partial credit. If a specific method is mentioned, make sure you show that you are using that method.

(1) (5 points) Use your own words to describe the Pythagorean (or Pythagoras') Theorem.



Solution. The Pythagorean (or Pythagoras') Theorem can be read as: For a right triangular, we have

$$adjacent\ leg^2 + opposite\ leg^2 = hypotenuse^2.$$

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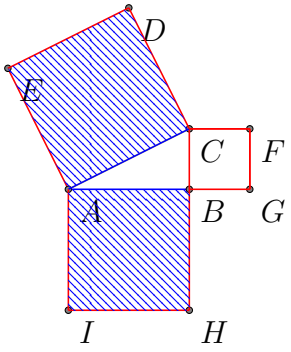
(2) (5 points) Below the shaded squares have areas of 144 and 169 square units, what is the area of the unmarked square?

Solution. From the left figure, we get the area of the unmarked square $\square CBGF$ is BC^2, the area of the marked square $\square ACED$ is $AC^2 = 169$ and the area of the marked square $\square ABHI$ is $AB^2 = 144$. In $\triangle ABC$, according to the Pythagorean (or Pythagoras') Theorem, we have

$$AC^2 = AB^2 + BC^2.$$

Hence,

$$\begin{aligned} BC^2 &= AC^2 - AB^2 \\ &= 169 - 144 \\ &= 25 \text{ square units.} \end{aligned}$$



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(3) (Bonus 2 points) Write out your favorite Pythagorean triples.

$$(3, 4, 5), (5, 12, 13)$$