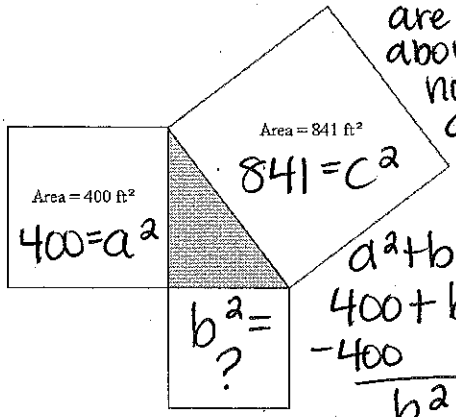
8.G.6 Explain a proof of the Pythagorean Theorem and its converse.

A right triangle is shaded in the diagram. The area of two squares is shown. What is the area of the third square?

Notice they are talking about areas not sides a, b, & c.



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

$400+b^2=841$

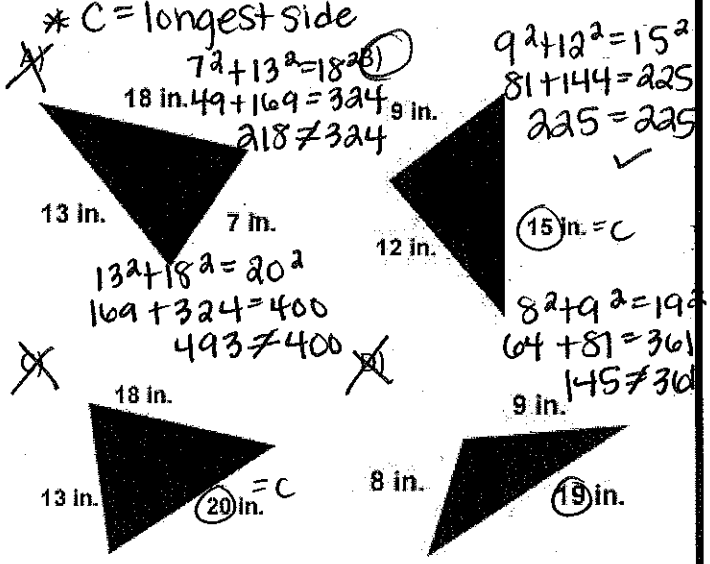
$-400 \quad -400$

$b^2=441$ ← area

A) 21 ft²
B) 35 ft²
C) 441 ft²
D) 1,241 ft²

Alyssa is building a birdhouse. She needs a right triangle for the roof. Which triangle below should you use?

* C = longest side



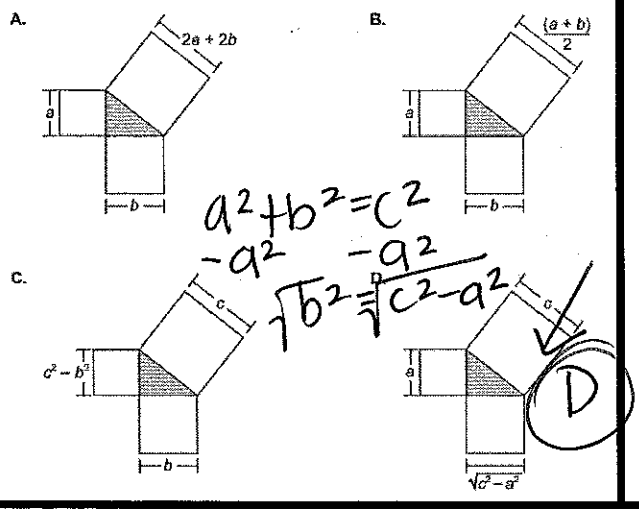
A) $7^2+13^2=18^2$ → $49+169=324$ → $218 \neq 324$

B) $9^2+12^2=15^2$ → $81+144=225$ → $225=225$ ✓

C) $13^2+18^2=20^2$ → $169+324=400$ → $493 \neq 400$

D) $8^2+9^2=19^2$ → $64+81=361$ → $145 \neq 361$

Renee is creating a diagram to prove that a certain triangle is a right triangle. In her diagram she uses three white quadrilaterals that are squares. Which diagram could be the one that Renee is creating?



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

$-a^2 \quad -a^2$

$b^2=c^2-a^2$

$b=\sqrt{c^2-a^2}$

D

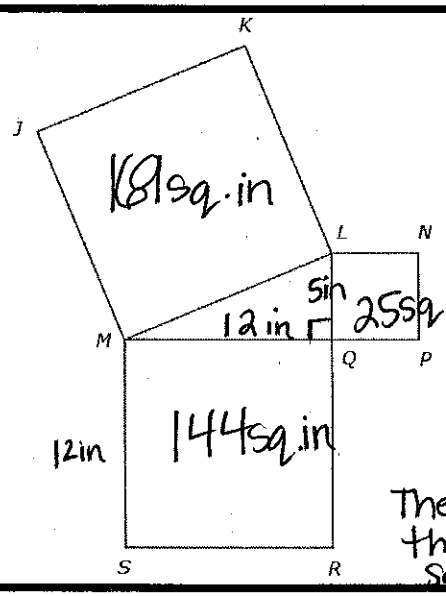
Given the lengths of the sides of a triangle, which of the following is *NOT* a right triangle?

A) 3, 4, 5 → $3^2+4^2=5^2$ → $9+16=25$ → $25=25$ ✓

B) 5, 12, 13 → $5^2+12^2=13^2$ → $25+144=169$ → $169=169$ ✓

C) 6, 8, 10 → $6^2+8^2=10^2$ → $36+64=100$ → $100=100$ ✓

D) 10, 12, 15 → $10^2+12^2=15^2$ → $100+144=225$ → $244 \neq 225$



The figure includes squares JKLM, LNPQ, and MQRS, and a right triangle LQM. Square JKLM has an area of 169 square inches. Side MQ has a length of 12 inches and side LQ has a length of 5 inches.

Part A: Find the areas of LNPQ and MQRS. Describe the relationship among the areas of the three squares. How does this support the Pythagorean Theorem?

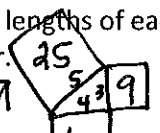
$5 \times 5 = 25 \text{ in}^2$

$12 \times 12 = 144 \text{ in}^2$

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

$25+144=169$ → $169=169$ ✓

Part B: Construct a figure similar to the one above that includes three squares making one right triangle. Label the areas of each square and the side lengths of each square. Show your work and explain your answer.



If the legs are 3 & 4 then hypotenuse is 5

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

$3^2+4^2=c^2$

$9+16=c^2$

$25=c^2$

$5=c$

The areas of the two smaller squares add up to area of largest square so, $a^2+b^2=c^2$