

Simplify the following expressions:

1. $a(b - a)$

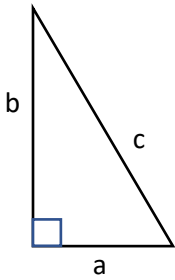
2. $-a(b - a)$

3. $b(b - a)$

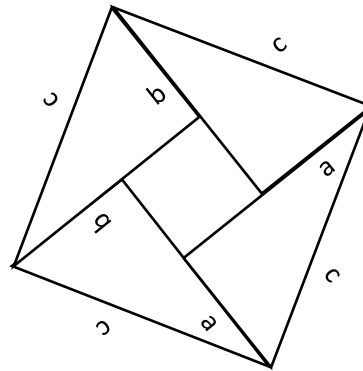
4. $(b - a)(b - a)$

5. $(b - a)^2$

6. Write an expression for the area of this right triangle:

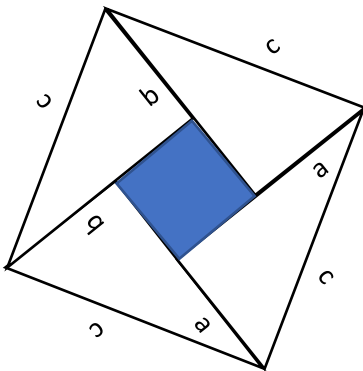


Four of the triangles at the left have been put together to make this square. Verify for yourself that the area of the large square is c^2 .



7. Write an expression for the side length of the small shaded square.

8. Write an expression for the area of the shaded square. Simplify the expression as you did in #4 and #5.

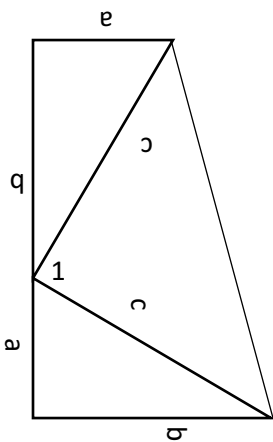


9. Write an expression for the total area of all four triangles.

10. Write an expression using #8 and #9 for the total area of the large square.

11. Therefore, what?

James A. Garfield was elected as the 20th President of the United States. Only four months after taking office, he was shot, and he died some weeks later from infection. Before the presidential election, Garfield discovered a new proof to the Pythagorean Theorem. It uses two of our original right triangles to make a trapezoid.



12. How do you know for sure that the angle marked with a 1 is a right angle?

13. Write the formula for the general area of a trapezoid:

14. Write an expression for the area of Garfield's trapezoid using the formula from #13.

15. Write an expression representing the area of one original triangle.

16. Write an expression representing the total area of all three triangles.

17. Since the expression from #16 and the expression from #14 both equal the area of the same trapezoid, they should be equal to each other. Set up an equation.

18. Use algebra to manipulate the equation in a way that would prove the Pythagorean Theorem.