

MATHCOUNTS[®]

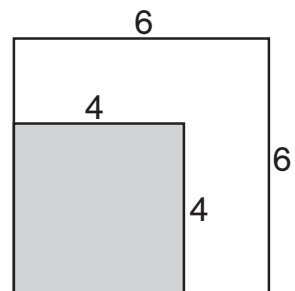
Difference of Squares



Warm-Up!

Try these problems before watching the lesson.

1. What is the value of $5^2 - 4^2$?
2. What is the value of $12^2 - 8^2$?
3. What is the value of $23^2 - 13^2$?
4. If a square of side length 4 units is placed on top of a square of side length 6 units, what is the area of the non-overlapping region?



The Problems

Take a look at the following problems and follow along as they are explained in the video.

5. What is the value of $4^2 - 3^2$?
6. What is the value of $212^2 - 211^2$?



Optional Extension

To extend your understanding and have a little fun with math, try the following activities.

Option 1

See if you can apply the difference of squares formula to find a quicker solution (*hint: you don't have to solve for the unknown*) to the following algebra problems:

$$\text{If } 2x + 3 = 1000, \text{ what is the value of } 4x^2 - 9?$$

$$\text{If } a - 2 = 6, \text{ then what is the value of } a^4 - 4a^2?$$

$$\text{If } x - y = 2 \text{ and } x^2 - y^2 = (55)(59) - (53)(57), \text{ what is the value of } x + y?$$

Option 2

Similar to difference of squares, there is an identity formula for a difference of cubes.

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

Using a geometric representation of difference of cubes, similar to the approach used to derive the difference of squares formula in the video, prove the difference of cubes formula to be true.