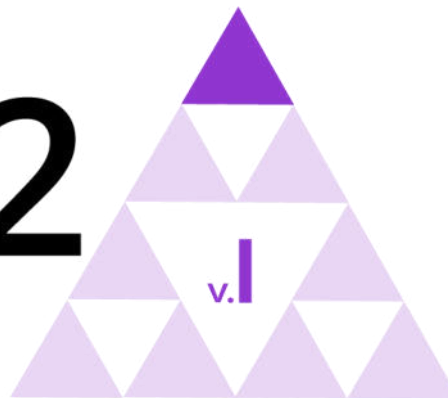


IM 9–12 MATH



Unit 2

Polynomials and Rational Functions

ALGEBRA 2

Lesson 23

Polynomial Identities (Part 1)

Learning Goal

Let's learn about polynomial identities.

Algebra 2

Let's Find Some Differences



Warm-up

1. Calculate the following differences:
 - a. $30^2 - 29^2$
 - b. $41^2 - 40^2$
 - c. $18^2 - 17^2$
1. What do you notice about these calculations?

A Closer Look at Differences



1. Clare thinks the difference between the squares of two consecutive integers will always be the sum of the two integers. Is she right? Explain or show your reasoning.
1. Pause here for a class discussion.
1. Andre thinks the difference between the squares of two consecutive even integers will always be 4 times the sum of the two integers. Is he right? Explain or show your reasoning.

That Expression is How Big?



Apply the distributive property to rewrite the following expressions without parentheses, combining like terms where possible. What do you notice?

1. $(x - 1)(x + 1)$
2. $(x - 1)(x^2 + x + 1)$
3. $(x - 1)(x^3 + x^2 + x + 1)$
4. $(x - 1)(x^4 + x^3 + x^2 + x + 1)$
5. $(x - 1)(x^{20} + x^{19} + \dots + x + 1)$



- What is another equation in the form $y =$ that has the same graph as $y = (x - 2)(x + 2)$?
- How would you explain why $y = (x - 1)(x^5 + x^4 + x^3 + x^2 + 1)$ and $y = x^6 - 1$ have the same graph?

I understand what an identity is in mathematics.

**Learning
Targets**

Algebra
2

Is This an Identity?



Cool-down

For x -values of -1 , 0 , and 1 , $(x - 1)(x^3 - x^2 - x + 1) = x^4 - 1$. Does this mean the equation is an identity? Explain your reasoning.



identity

An equation which is true for all values of the variables in it.



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