

Secondary III 2-1 HW
Operations with Polynomials

Name: _____

1. Write the polynomial $-23x^7 + x^9 - 6x^3 + 10 + 2x^2$ in standard form, and then identify the degree and leading coefficient.

Add the polynomials.

2. $(82x^8 + 21x^2 - 6) + (18x + 7x^8 - 42x^2 + 3)$
3. $(15x - 121x^{12} + x^9 - x^7 + 3x^2) + (x^7 - 68x^2 - x^9)$
7. $(x^4 - 7x^3 + 2 - x) + (2x^3 - 3) + (1 - 5x^3 - x^4 + x)$

Subtract the polynomials.

8. $(-2x + 23x^5 + 11) - (5 - 9x^3 + x)$
11. $(9x - 12x^3) - (5x^3 + 7x - 2)$
13. $(10x^2 - x + 4) - (5x + 7) + (6x - 11)$

Find the polynomial that models the problem and use it to estimate the quantity.

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- 16.** Cho is making a garden, where the length is x feet and the width is $4x - 1$ feet. He wants to add garden stones around the perimeter of the garden once he is done. If the garden is 4 feet long, how many feet will Cho need to cover with garden stones?
- 18. Business** From data gathered in the period 2008–2012, the yearly amount of U.S. exports can be modeled by the function $E(x) = -228x^3 + 2552.8x^2 - 6098.5x + 11,425.8$, where x is the number of years after 2008 and $E(x)$ is the amount of exports in billions of dollars. The yearly amount of U.S. imports can be modeled by the function $I(x) = -400.4x^3 + 3954.4x^2 - 11,128.8x + 17,749.6$, where x is the number of years after 2008 and $I(x)$ is the amount of imports in billions of dollars. Estimate the total amount the United States imported and exported in 2012.

- 22. Explain the Error** Colin simplified $(16x + 8x^2y - 7xy^2 + 9y - 2xy) - (-9xy + 8xy^2 + 10x^2y + x - 7y)$. His work is shown below. Find and correct Colin's mistake.

$$\begin{aligned} & (16x + 8x^2y - 7xy^2 + 9y - 2xy) - (-9xy + 8xy^2 + 10x^2y + x - 7y) \\ &= (16x + 8x^2y - 7xy^2 + 9y - 2xy) + (9xy - 8xy^2 - 10x^2y - x + 7y) \\ &= (16x - x) + (8x^2y - 7xy^2 - 8xy^2 - 10x^2y) + (9y + 7y) + (-2xy + 9xy) \\ &= 15x - 17x^2y^2 + 16y + 7xy \end{aligned}$$

- 1.** The dimensions for a rectangular prism are $x + 5$ for the length, $x + 1$ for the width, and x for the height. What is the volume of the prism?

Perform the following polynomial multiplications.

5. $(2x + 5y)(3x^2 - 4xy + 2y^2)$

6. $(x^3 + x^2 + 1)(x^2 - x - 5)$

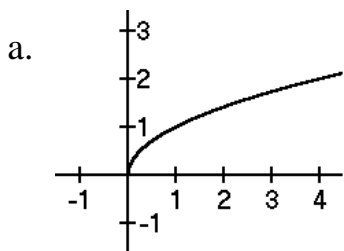
10. **Biology** A biologist has found that the number of branches on a certain rare tree in its first few years of life can be modeled by the polynomial $b(y) = 4y^2 + y$. The number of leaves on each branch can be modeled by the polynomial $l(y) = 2y^3 + 3y^2 + y$, where y is the number of years after the tree reaches a height of 6 feet. Write a polynomial describing the total number of leaves on the tree.

Verify the given polynomial identity.

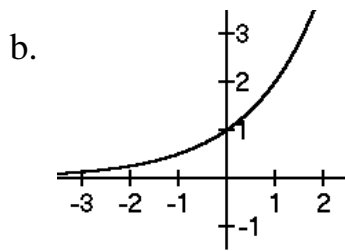
12. $(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2xz + 2yz$

Review

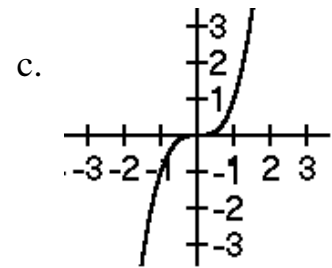
Name and write an equation to represent each parent function.



Name:
 Equation:



Name:
 Equation:



Name:
 Equation: