Write your questions and thoughts here!

7.3 – Add Subtract and Multiply Polynomials

Adding Polynomials

To add polynomials, simply _____:

Examples:

a.

b. $(2t^3 + t - 4t^2) + (-2t^3 + 4t^2 + 1)$

Subtracting Polynomials

To subtract polynomials, simply _____:

Examples:

c.

d. $(10y^4 + y - 4y^2\ ) - (-2y^3 + 4y^2 + 1\ )$

Multiplying Polynomials

To multiply polynomials, use _____ and _____:

Examples:

e.

f.

g.

h. $(a + b)^3$

Special Product Patterns

Example

Difference of Perfect Squares

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

Square of a Binomial

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

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

Cube of a Binomial

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

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

You try!

Find the product

a. $(x-2)^2 =$

b. $(3t-4)(3t+4) =$

c. $(7x-y)^3 =$

Now summarize what you have learned!

.**Simplify each expression.**

1) $(2m - 6m^3) + (7m + 7m^3)$

2) $(7x + 6x^4) + (7x^3 - 5x^4 - x)$

3) $(3 - 4k^4 - 4k^2) - (5k^3 + 2k^2 - 3)$

4) $(5n^2 + 5n^3 + n) - (8n^3 + 3n - 6n^2)$

Find each product.

5) $(4x + 1)(3x - 7)$

6) $(6 - 8n)^2$

7) $(7u + 6v)(7u + 8v)$

8) $(3m - 2n)(3m + 2n)$

9) $(6x^2 + 5x - 3)(6x - 8)$

10) $(x + 6)^2$

11) $(5v - 4)(5v + 4)$

12) $(6a^2 - 4ab + 7b^2)(3a - 7b)$

13) $(2v - 4)^2$

14) $(m + 3)(4m - 5)$

15) $(-6x + 5y)^2$

16) $(3r + 8)(3r^2 + 8r - 8)$

17) $(3p - 7)^3$

18) $(7 + 4x)^3$

7.3 – Add Subtract and Multiply Polynomials

Application 7.3

1. Simplify: $(3t^2 - 4t + 2) - (5 - t^2 - t)$

2. Find the product: $(3x - 4)(3x + 4)(9x^2 + 16)$

3. Since 1970, the number of females F and males M attending institutes of higher education (in thousands) can be modeled by:

$$F = 0.19t^3 - 12t^2 + 350t + 3600 \quad \text{and} \quad M = 0.091t^3 - 4.8t^2 + 110t + 5000$$

where t is the number of years since 1970. Write a model that represents the TOTAL number of people attending institutes of higher learning.

4. One day, Bean is walking with his son in a toddler backpack when he realizes: "Hey they should make these things for skinny adults, like me!" He quickly designs an adult size Alge-Backpack! The skinny community loves it! From 2013 – 2018, the number B (in millions) of Alge-Backpacks sold worldwide and the price P (in $) can be modeled by

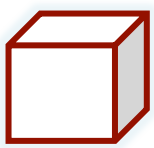
$B = 4.11t + 4.44$ and $P = 6.82t^2 - 61.7t + 265$

where t is the number of years since 2013.

a. Write a model for the total revenue R that Bean makes from his invention.

b. According to your model, how much revenue will Bean make from the Alge-backpacks in 2015?

5. Write the volume as a polynomial in standard form:



$V_{cube} = s^3$

7.3 – Add Subtract and Multiply Polynomials

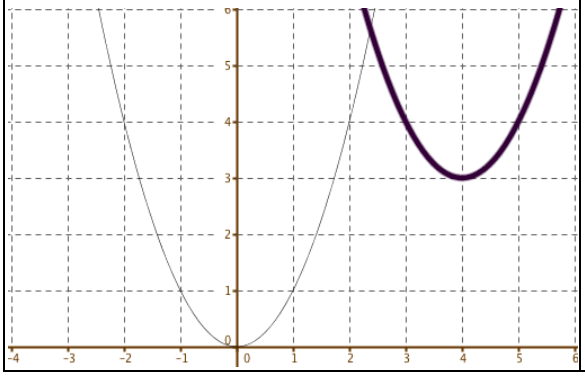
Algebra Skillz

GRAPH

Below, the graph of $f(x) = (x-4)^2 + 3$ is sketched in bold. Its parent function $f(x) = x^2$ is represented by the thin curve.

1. Describe the translation of the parent graph.

2. How does the translation relate to the equation?



SIMPLIFY

3. $\sqrt{40} + \sqrt{70} + \sqrt{90}$

4. $\sqrt{2}(12 + 2\sqrt{2})$

SOLVE

5. Solve:
$x(x-1)(2x+3) = 0$

6. Factor and solve.
$x^2 - 101x + 100 = 0$

SAT Review

MUTIPLE CHOICE

If $(a+b)^2 = 144$ and $(a-b)^2 = 64$, what is the value of ab?

(A) 16
(B) 18
(C) 20
(D) 22
(E) 24

Free Response

If *k* and *n* are constants and

$x^2 + kx + 10 = (x+2)(x+n)$

find the value of k.