Lesson 1.2.4: Factoring the Sum and Difference of Two Cubes

Perfect Cube: numbers or expressions that can be expressed to the power of 3

How to Factor a Sum of Two Cubes:

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

How to Factor a Difference of Two Cubes:

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

Steps in Factoring the Sum and Difference of Two Cubes:

1. Factor out the greatest common monomial of all terms of the given expression.
2. Write each term as a cube.
3. Write the binomial factor. To find the binomial factor:
   3.1 Find the cube root of the first cube.
   3.2 Find the cube root of the second cube, then affix the sign of the second cube.
4. Write the trinomial factor. To find the trinomial factor:
   4.1 Square the first term of the binomial factor.
   4.2 Multiply the first and second terms of the binomial factor, then affix the sign that is opposite the sign of the second term.
   4.3 Square the second term of the binomial factor.

Practice Exercises 1.2.4

Factor the following polynomials completely.

1. x^3+64y^3
2. $8x^3-y^3z^6$
3. a^9+125b^6
4. $27m^3-8n^3$
5. $64a^3-27b^3c^6$

Activity 1.2.4

Factor the following polynomials completely.

1. $27x^3-64y^3z^6$
2. $8x^3+125$
3. $64a^3-8b^9c^3$
4. $27m^3+125n^3$
5. $64a^3+27$
6. $8x^9y^3-64z^6$
7. $216x^3+8y^9$
8. $a^3b^6-64c^9d^3$
9. $125m^3-27n^6$
10. $216a^6+64b^9$

Lesson 1.2.4: Factoring the Sum and Difference of Two Cubes (copy 2)

Perfect Cube: numbers or expressions that can be expressed to the power of 3
How to Factor a Sum of Two Cubes: $a^3+b^3=(a+b)(a^2-ab+b^2)$
How to Factor a Difference of Two Cubes: $a^3-b^3=(a-b)(a^2+ab+b^2)$
Steps in Factoring the Sum and Difference of Two Cubes:
1. Factor out the greatest common monomial of all terms of the given expression.
2. Write each term as a cube.
3. Write the binomial factor. To find the binomial factor:
3.1 Find the cube root of the first cube.
3.2 Find the cube root of the second cube, then affix the sign of the second cube.
4. Write the trinomial factor. To find the trinomial factor:
4.1 Square the first term of the binomial factor.
4.2 Multiply the first and second terms of the binomial factor, then affix the sign that is opposite the sign of the second term.
4.3 Square the second term of the binomial factor.
Practice Exercises 1.2.4
Factor the following polynomials completely.
1. x^3+64y^3 2. $8x^3-y^3z^6$ 3. a^9+125b^6 4. $27m^3-8n^3$ 5. $64a^3-27b^3c^6$
Activity 1.2.4
Factor the following polynomials completely.
1. $27x^3-64y^3z^6$ 2. $8x^3+125$ 3. $64a^3-8b^9c^3$ 4. $27m^3+125n^3$ 5. $64a^3+27$ 6. $8x^9y^3-64z^6$ 7. $216x^3+8y^9$ 8. $a^3b^6-64c^9d^3$ 9. $125m^3-27n^6$ 10. $216a^6+64b^9$

Lesson 1.2.4: Factoring the Sum and Difference of Two Cubes (copy 3) — identical to the above.

Lesson 1.2.4: Factoring the Sum and Difference of Two Cubes (copy 4) — identical to the above.