

Unit Conversions

- Make sure you keep all your units diagonal
- K H D b d c m
- Example: Convert 50 miles per hour to feet per second

Parts of an Expression

$$x^3 - 2x^2 + 3x - 4$$

Identify:

Terms:

Degree:

Coefficients:

Constants:

Rational vs Irrational

- Real, Rational, Integer, Whole, Counting
- Real, Irrational

Rational + Rational =

Rational + Irrational =

Irrational + Irrational =

Irrational * Irrational +

Operations with PolynomialsAdding and Subtracting

- Combine like terms
- When subtracting distribute the negative 1st

Example 1: $(2r^3 + 5r^2 - 2r) + (5r^4 - 3r - 3r^2)$

Example 2: $(7r^3 + 5r^2 + r^4) - (r^4 + 4r^3 - 8r^2)$

Multiplying

- Double Distribution
- Combine like Terms

Example: $(n - 4)(5n + 2)$

RadicalsSimplifying

- Need to find a perfect square and a prime number
- Take the square root of the perfect square and place it outside of the radical
- The prime or imperfect number stays on the inside
- Variables: divide the exponents by two (find the groups of two)

Example 1: $\sqrt{32}$

Example 2: $\sqrt{72x^4y^3}$

Adding and Subtracting

- Must have like radicands: the same number underneath the house (simplify)
- Only add the coefficients

Example 1: $-\sqrt{45} + 2\sqrt{5}$

Example 2: $-\sqrt{27} + 2\sqrt{12} - 3\sqrt{8}$

Multiplying Radicals

- Multiply the outside with outside and inside with inside
- Simplify

Example 1: $-3\sqrt{3} \cdot \sqrt{6}$

Example 2: $2\sqrt{10}(\sqrt{2} + 2\sqrt{3})$

Unit Conversions

- Make sure you keep all your units diagonal
- K H D b d c m
- Example: Convert 50 miles per hour to feet per second

$$\frac{50 \text{ miles}}{1 \text{ hr}} * \frac{5280 \text{ ft}}{1 \text{ Mile}} * \frac{1 \text{ hr}}{60 \text{ min}} * \frac{1 \text{ min}}{60 \text{ sec}} = \frac{264000}{3600} = 73.\bar{3} \text{ ft/sec}$$

Parts of an Expression

$$1x^3 - 2x^2 + 3x - 4$$

Identify:

Terms: 4 → poly

Degree: 3 → cubic

Coefficients: 1, -2, 3

Constants: -4

3 tri
2 bi
1 Mon
2 Quadratic
1 linear

Rational vs Irrational

- Real, Rational, Integer, Whole, Counting
- Real, Irrational

Rational + Rational = R

Rational + Irrational = I

Irrational + Irrational = I

Irrational * Irrational = SOMETIMES R

$$\sqrt{2} * \sqrt{2} = \sqrt{4} = 2$$

Operations with Polynomials

Adding and Subtracting

- Combine like terms
- When subtracting distribute the negative 1st

Example 1: $(2r^3 + 5r^2 - 2r) + (5r^4 - 3r - 3r^2)$
 $5r^4 + 2r^3 + 2r^2 - 5r$

Example 2:

$$(7r^3 + 5r^2 + r^4) - (r^4 + 4r^3 - 8r^2)$$

$$7r^3 + 5r^2 - r^4 - 4r^3 + 8r^2$$

$$3r^3 + 13r^2$$

Multiplying

- Double Distribution
- Combine like terms

Example: $(n-4)(5n+2)$
 $5n^2 + 2n - 20n - 8$
 $5n^2 - 18n - 8$

Radicals

Simplifying

- Need to find a perfect square and a prime number 2, 3, 5, 7, 10, 11...
- Take the square root of the perfect square and place it outside of the radical
- The prime or imperfect number stays on the inside
- Variables: divide the exponents by two (find the groups of two)

Example 1: $\sqrt{32}$ → $2 \sqrt{8}$ → $4\sqrt{2}$

Example 2: $\sqrt{72x^4y^3}$
 $6x^2y\sqrt{2y}$

Adding and Subtracting

- Must have like radicands: the same number underneath the house (simplify)
- Only add the coefficients

Example 1: $3\sqrt{45} + 2\sqrt{5}$
 $-3\sqrt{5} + 2\sqrt{5} = -1\sqrt{5}$

Example 2: $3\sqrt{27} + 2\sqrt{12} - 3\sqrt{8}$
 $3\sqrt{3} + 4\sqrt{3} - 6\sqrt{2}$
 $\sqrt{3} - 6\sqrt{2}$

Multiplying Radicals

- Multiply the outside with outside and inside with inside
- Simplify

Example 1: $-3\sqrt{3} \cdot \sqrt{6}$
 $-9\sqrt{2}$

Example 2: $2\sqrt{10}(\sqrt{2} + 2\sqrt{3})$
 $4\sqrt{5} + 4\sqrt{30}$