

3.5 Collecting Like Terms

Brain Teaser

At King's, the ratio of males to females writing the Pascal Contest is 3 : 7. If there are 21 males writing the Contest, what is the total number of students writing?

49

Part 1: DO IT NOW

1) What is the degree of the term: $3x^2y^1z^1$

4

2) What is the degree of this polynomial:

$$3a^2b^3c + 2ab^4c^2 - 7abc^2$$

7

3) Classify the polynomial from question 2) by name:

Trinomial

Part 2: Like Terms

Like Terms are terms that have the EXACT same

VARIABLES with the EXACT same **EXPONENTS**

These are like terms:

$$3x^2y \text{ and } 15x^2y$$

These are NOT like terms:

$$3x^2y \text{ and } 3x^2y^2$$

Identify the like terms in this polynomial:

$$3x^3 - 5x + 2x^3 + 3 - 1 + 4x + 12x^3 - 120$$

$3x^3, 2x^3, 12x^3$ are like terms.

$-5x, 4x$ are like terms

$3, -1, -120$ are like terms.

Identify the like terms in this polynomial:

$$5x^2y - 9xy + 6x^2y + 17.3x - 2xy + 4x^2y + 92x - 133xy$$

$5x^2y, 6x^2y, 4x^2y$ are like terms

$-9xy, -2xy, -133xy$ are like terms

$17.3x, 92x$ are like terms.

Part 3: Collecting Like Terms

When *adding/subtracting like terms*, keep the variables the same, and *add/subtract only the coefficients*.

Example:

$$6x + 4 + 8x + 3$$

$$= 6x + 8x + 4 + 3$$

Step 1: Rearrange like terms into groups

$$= 14x + 7$$

Step 2: Add/Subtract the like terms

Practice Collecting Like Terms

1) $3x + 4x = 7x$

2) $3x^2 + 5x^2 + 3 = 8x^2 + 3$

Practice Collecting Like Terms

$$\begin{aligned} 3) \quad & 2b - b + 7 - 8 + 3b \\ & = 2b - 1b + 3b + 7 - 8 \\ & = 4b - 1 \end{aligned}$$

$$\begin{aligned} 4) \quad & 3x^2 + 2 - 6x + 9x - 3x^2 \\ & = 3x^2 - 3x^2 - 6x + 9x + 2 \\ & = 0x^2 + 3x + 2 \\ & = 3x + 2 \end{aligned}$$

$$\begin{aligned} 5) \quad & 2x^2 - 3y^2 + xy + 2y^2 - 8x^3 \\ & = -8x^3 + 2x^2 + xy - 3y^2 + 2y^2 \\ & = -8x^3 + 2x^2 + xy - y^2 \end{aligned}$$

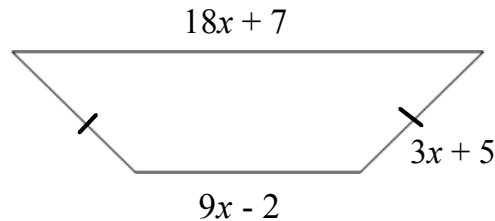
Note: degree of terms should be in descending order (highest degree terms on the left).

$$\begin{aligned} 6) \quad & a^2b + 2ab - ab^2 + 2ab^2 - 3ab + a^2b \\ & = 1a^2b + 1a^2b - 1ab^2 + 2ab^2 + 2ab - 3ab \\ & = 2a^2b + ab^2 - ab \end{aligned}$$

7)

Part 4: Apply Our Knowledge!

a) Write an expression in simplest form for the perimeter of the given shape



$$\begin{aligned} \text{Perimeter} &= 18x + 7 + 9x - 2 + 3x + 5 + 3x + 5 \\ &= 18x + 9x + 3x + 3x + 7 - 2 + 5 + 5 \\ &= 33x + 15 \end{aligned}$$

b) Evaluate the expression if $x = 5$. (What is the perimeter?)

$$\begin{aligned} \text{Perimeter} &= 33x + 15 \\ &= 33(5) + 15 \\ &= 165 + 15 \\ &= 180 \text{ units.} \end{aligned}$$