SM3 2.1: Polynomial Operations Key

Vocabulary: Polynomial, Monomial, Term, Degree of a term, Degree of a polynomial, Descending Order, Coefficient, Lead Coefficient, Constant

Vocabulary Problems: Answer the questions about each function:

1) $a(x) = -7x + 4x^2 + 3$

$a(x)$ is a: monomial polynomial (circle one)
Number of terms: 3
Degree of $a(x)$: 2
Rewrite $a(x)$ in descending order:
$a(x) = 4x^2 - 7x + 3$

Lead coefficient of $a(x)$: 4
State the constant term of $a(x)$: 3

5) $f(x) = -15$

$f(x)$ is a: monomial polynomial (circle one)
Number of terms: 1
Degree of $f(x)$: 0
Rewrite $f(x)$ in descending order:
$f(x) = -15$

Lead coefficient of $f(x)$: -15
State the constant term of $f(x)$: -15

3) $c(x) = 200x^7$

$c(x)$ is a: monomial polynomial (circle one)
Number of terms: 1
Degree of $c(x)$: 7
Rewrite $c(x)$ in descending order:
$c(x) = 200x^7$

Lead coefficient of $c(x)$: 200
State the constant term of $c(x)$: 0

4) $d(x) = 10x^4 - 6x^3 + 2x^5 - 7x^8$

$d(x)$ is a: monomial polynomial (circle one)
Number of terms: 4
Degree of $d(x)$: 8
Rewrite $d(x)$ in descending order:
$d(x) = -7x^8 + 2x^5 + 10x^4 - 6x^3$

Lead coefficient of $d(x)$: -7
State the constant term of $d(x)$: 0

Problems: Simplify each expression into a single polynomial.

7) $(2x - 5) + (7x + 8)$

$2x - 5 + 7x + 8$

$9x + 3$

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

$5x^2 - x + 2x^2 + 6x$

$7x^2 + 5x$

9) $(3x^2 - 5) + (4x^2 + 10x)$

$3x^2 - 5 + 4x^2 + 10x$

$7x^2 + 10x - 5$

10) $(x^2 - 3x + 7) + (5x^2 + 3x + 10)$

$x^2 - 3x + 7 + 5x^2 + 3x + 10$

$6x^2 + 17$

11) $(-2x^2 + 4x + 6) + (6x^2 + 3x - 9)$

$-2x^2 + 4x + 6 + 6x^2 + 3x - 9$

$4x^2 + 7x - 3$

12) $(5x + x^2 + 5) + (2x^2 + 6)$

$5x + x^2 + 5 + 2x^2 + 6$

$3x^2 + 5x + 11$

13) $(-4x^2 + 4x + 1) + (15x - 6x^2 - 11)$

$-4x^2 + 4x + 1 + 15x - 6x^2 - 11$

$-10x^2 + 19x - 10$

14) $(x - 5) - (x + 3)$

$x - 5 - x - 3$

-8

15) $(5x^2 - 2x) - (3x^2 + 4x)$

$5x^2 - 2x - 3x^2 - 4x$

$2x^2 - 6x$

16) $(7x^2 + 1) - (2x^2 - 6x)$

$7x^2 + 1 - 2x^2 + 6x$

$5x^2 + 6x + 1$

17) $(2x - x^2 + 1) - (4x^2 + 1)$

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

$-5x^2 + 2x$

18) $(-9x^2 + 4x + 1) - (2x + 3x^2 - 1)$

$-9x^2 + 4x + 1 - 2x - 3x^2 + 1$

$-12x^2 + 2x + 2$

19) $(2x - 5)(7x + 8)$

$14x^2 + 16x - 35x - 40$

$14x^2 - 19x - 40$

20) $(5x - 1)(2x + 10)$

$10x^2 + 50x - 2x - 10$

$10x^2 + 48x - 10$

21) $4x(4x + 7)$

$16x^2 + 28x$

22) $(2x^2 - 5)(3x + 4)$

$6x^3 + 8x^2 - 15x - 20$

23) $(5x^2 + 3)(9x - 5)$

$45x^3 - 25x^2 + 27x - 15$

24) $(3x - 1)(3x - 1)$

$9x^2 - 3x - 3x + 1$

$9x^2 - 6x + 1$

25) $(3x - 1)(x + 2) - (4x^2 + 3)$

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

$3x^2 + 5x - 2 - 4x^2 - 3$

$-x^2 + 5x - 5$

26) $(3x - 1) - (x + 2)(4x^2 + 3)$

$(3x - 1) - (4x^3 + 3x + 8x^2 + 6)$

$3x - 1 - 4x^3 - 3x - 8x^2 - 6$

$-4x^3 - 8x^2 - 7$

27) Problems 25) and 26) have the same terms being operated on but with a minor adjustment in how the terms are grouped. Write a sentence that explains why the results for those two problems are not the same.

While the terms are the same, the terms are not being operated on by the same operators, in the same order. Consequentially, the result may differ.