Section 5.4: Adding and Subtracting Polynomials

1. Which of the following is NOT a polynomial expression?
   (a) $3x^2 - 4x - \sqrt{17}$
   (b) $5x^{1/2} + 7$
   (c) $mx + b$
   (d) 15
   (e) More than one of the above are not polynomial expressions.

2. What are the terms of the algebraic expression $3y^2 - 5xy + 7$?
   (a) $y^2, xy, and 7$
   (b) $3y^2$ and $5xy$
   (c) $3y^2$ and $-5xy$
   (d) $3y^2, 5xy, and 7$
   (e) $3y^2, -5xy, and 7$

3. What is the degree of the polynomial $y = 3x^2 + 2x^7 + 10x$?
   (a) 2
   (b) 3
   (c) 7
   (d) 10

4. What is the degree of $7x^3 - 4x^6 + 9x^2 + 2$?
   (a) 3
   (b) 4
   (c) 6
   (d) 7

5. What is the leading term of the polynomial $y = 3x^2 + 2x^7 - 11x$?
6. What is the leading coefficient of the polynomial \( y = 3x^2 + 2x^7 + 10x \)?

(a) 2  
(b) 3  
(c) 7  
(d) 10

7. **True or False:** The coefficients of \(-4x^3 + 6x^2 - x + 9\) are \(-4, 6, -1,\) and 9.

(a) True, and I am very confident  
(b) True, but I am not very confident  
(c) False, but I am not very confident  
(d) False, and I am very confident

8. What property is illustrated by \( 5x^2 + 11x^2 = (5 + 11)x^2 \)?

(a) Associative property of addition  
(b) Commutative property of multiplication  
(c) Distributive property  
(d) Associative property of multiplication

9. Which of the following shows a pair of like terms?

(a) \(3x^2\) and \(3x\)  
(b) \(3x^2\) and \(4x^2\)  
(c) \(3x^2\) and \(2x^3\)  
(d) \(3x^2\) and 3  
(e) All of the above
10. Simplify: $2x^2y - 3xy^2 + 7xy^2 + 8x^2y$

(a) $14x^2y^2$
(b) $-x^2y + 15xy^2$
(c) $9x^2y + 5xy^2$
(d) $10x^2y + 4xy^2$

11. Simplify completely: $(3x^4 - x^2 + 7) + (-9x^2 + 1)$

(a) $3x^4 - x^2 + 7 + 9x^2 - 1$
(b) $-27x^6 + 12x^4 - 64x^2 + 7$
(c) $-27x^8 + 12x^4 - 64x^2 + 7$
(d) $3x^4 - 10x^2 + 8$

12. Find the sum $(-6x^2 - 7x + 16) + (-8x^3 - 9x^2 - 16)$.

(a) $-14x^5 - 16x^3$
(b) $-14x^5 - 16x^3 + 32$
(c) $-14x^3 - 16x^2 + 32$
(d) $-8x^3 - 15x^2 - 7x$

13. Simplify completely: $(3x^4 - x^2 + 7) - (-9x^2 + 1)$

(a) $3x^4 - x^2 + 7 + 9x^2 - 1$
(b) $3x^4 + 8x^2 + 6$
(c) $3x^4 - 8x^2 + 6$
(d) $3x^4 - 10x^2 + 8$

14. Find the difference: $(7x^2 - 2x + 11) - (9x^3 + 9x^2 + 11)$.

(a) $-9x^3 - 2x^2 - 2x$
(b) $-9x^3 + 16x^2 - 2x + 22$
(c) $-2x^3 - 11x^2 + 22$
(d) $-9x^3 + 16x^2 - 2x$
15. Perform the indicated operations and simplify:
\[(9x^2 + 8x - 2) - [(−6x^3 + 3x^2 + 7) + (−2x + 15)]\]

(a) \(-6x^3 + 6x^2 + 6x + 20\)
(b) \(6x^3 + 6x^2 + 10x - 24\)
(c) \(6x^3 + 12x^2 + 6x + 20\)
(d) \(-6x^3 + 12x^2 + 10x - 24\)
(e) \(6x^3 + 6x^2 + 6x + 20\)

16. \(P(x) = −x^2 + 17x − 30\) represents the profit, in Euros, gained from selling \(x\) units of a product. What is the value of \(P(5)\)?

(a) \(-30\)
(b) 12
(c) 30
(d) 80

17. \(P(x) = −x^2 + 17x − 30\) represents the profit, in Euros, gained from selling \(x\) units of a product. What is the contextual meaning of \(P(5) = 30\)?

(a) When 30 units are sold, the profit is 5 Euros.
(b) When 5 units are sold, the profit is 30 Euros.
(c) When 30 people sell units, their profit is 5 Euros.
(d) When 5 people sell units, their profit is 30 Euros.

18. What is the polynomial expression for “Eight less than the opposite of four \(y\)”? 

(a) \(8 − (−4y)\)
(b) \(-8 + 4y\)
(c) \(8 − (−yyyy)\)
(d) \(-4yy − 8\)
(e) \(−yyyy − 8\)