

4.2 Practice B

In Exercises 1 and 2, find the sum.

$$1. (8x^7 - 6x^5 + 4x^3 - 6x) + (15x^6 + 4x^5 - 3x^3 + 2) = 8x^7 + 15x^6 - 2x^5 + x^3 - 6x + 2$$

$$2. (8x^4 - 2x^3 + 9x^2 + 7x + 14) + (6x^4 - 5x^3 - 9x^2 - 11x - 9) =$$

$$14x^4 - 7x^3 - 4x + 5$$

In Exercises 3 and 4, find the difference.

$$3. (9x^5 + 5x^4 - 9x^2 + 10x) - (12x^5 + 2x^4 - x^2 - 9) = -3x^5 + 3x^4 - 8x^2 + 10x + 9$$

$$4. (12x^4 - 6x^2 + 2x + 14) - (3x^4 - 5x^3 + 9x + 3) = 9x^4 + 5x^3 - 6x^2 + 11x + 11$$

In Exercises 5–8, find the product.

$$5. (x^2 - 7x - 2)(x^2 - 3x - 6) = x^4 - 10x^3 + 13x^2 + 48x + 12$$

$$6. (2x^2 + 3x - 1)(-5x^2 - 2x + 4) = -10x^4 - 19x^3 + 7x^2 + 14x - 4$$

$$7. (4x^2 - 3x + 6)(x^2 - 2x + 2) = 4x^4 - 11x^3 + 20x^2 - 18x + 12$$

$$8. (3x^2 - 6x - 5)(x^4 + 2x^2 + 5x) = 3x^6 - 6x^5 + x^4 + 3x^3 - 40x^2 - 25x$$

9. Describe and correct the error in performing the operation.

$$\times 4x^2(3x^4 - 2x^3 + 7) = 12x^8 - 8x^6 + 28x^2$$

Exponents should be added, not multiplied.

In Exercises 10–13, find the product of the binomials.

$$10. (x - 3)(2x + 2)(3x - 1) = 6x^3 - 14x^2 - 14x + 6$$

$$11. (2x + 3)(x - 5)(4x + 1) = 8x^3 - 26x^2 - 67x - 15$$

$$12. (2x - 1)(3 - 2x)(4x + 5) = -16x^3 + 4x^2 + 18x - 15$$

$$13. (5 - 2x)(2 - x)(4x + 3) = 8x^3 - 30x^2 + 13x + 30$$

In Exercises 14–16, find the product.

$$14. (3x + 5)(3x - 5) = 9x^2 - 25$$

$$15. (6t + 7)^2 = 36t^2 + 84t + 49$$

$$16. (pq + 2)^2 = p^2q^2 + 4pq + 4$$

17. A rectangular pool has a level floor. The length of the pool is $(3x - 1)$ feet, the width of the pool is $(x + 6)$ feet, and the depth of the pool is $(x + 6)$ feet.

a. Write an expression for the volume of the pool as a product of binomials.

$$(3x - 1)(x + 6)(x + 6)$$

b. Write an expression for the volume of the pool as a polynomial in standard form.

$$\rightarrow 3x^3 + 35x^2 + 96x - 36$$

over
→

Binomial Expansion Worksheet

Expand completely. *You must show work.*

1) $(1 + 2a)^5$

2) $(5b + 1)^3$

3) $(2b - 1)^3$

4) $(3u + 1)^5$

5) $(2y^4 - 1)^6$

6) $(1 + 2x^3)^5$

7) $(3x^2 - 1)^5$

8) $(4n^3 + 1)^4$

9) $(2y^2 - 1)^6$

10) $(1 + 3n^3)^4$

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$$\begin{array}{r}
 \textcircled{5} \quad x^2 - 7x - 2 \\
 \quad \quad x^2 - 3x - 6 \\
 \hline
 \quad \quad -6x^2 + 42x + 12 \\
 \quad -3x^3 + 21x^2 + 6x \\
 \hline
 x^4 - 7x^3 - 2x^2 \\
 \hline
 x^4 - 10x^3 + 13x^2 + 48x + 12
 \end{array}$$

$$\begin{array}{r}
 \textcircled{6} \quad 2x^2 + 3x - 1 \\
 \quad \quad -5x^2 - 2x + 4 \\
 \hline
 \quad \quad 8x^2 + 12x - 4 \\
 \quad -4x^3 - 6x^2 + 2x \\
 \hline
 -10x^4 - 15x^3 + 5x^2 \\
 \hline
 -10x^4 - 19x^3 + 7x^2 + 14x - 4
 \end{array}$$

$$\begin{array}{r}
 \textcircled{7} \quad 4x^2 - 3x + 6 \\
 \quad \quad x^2 - 2x + 2 \\
 \hline
 \quad \quad 8x^2 - 6x + 12 \\
 \quad -8x^3 + 6x^2 - 12x \\
 \hline
 4x^4 - 3x^3 + 6x^2 \\
 \hline
 4x^4 - 11x^3 + 20x^2 - 18x + 12
 \end{array}$$

$$\begin{array}{r}
 \textcircled{8} \quad 3x^2 - 6x - 5 \\
 \quad \quad x^4 + 2x^2 + 5x \\
 \hline
 \quad \quad 15x^3 - 30x^2 - 25x \\
 \quad 6x^4 - 12x^3 - 10x^2 \\
 \hline
 3x^6 - 6x^5 - 5x^4 \\
 \hline
 3x^6 - 6x^5 + x^4 + 3x^3 - 40x^2 - 25x
 \end{array}$$

$$\begin{array}{r}
 \textcircled{10} \quad (2x+2)(3x-1) \\
 \quad \quad 6x^2 \quad + \overset{6x}{-2x} \quad -2 \\
 \quad \quad \quad \quad x-3 \\
 \hline
 \quad \quad -18x^2 - 12x + 6 \\
 \quad 6x^3 + 4x^2 - 2x \\
 \hline
 6x^3 - 14x^2 - 14x + 6
 \end{array}$$

$$\begin{array}{r}
 \textcircled{11} \quad (2x+3)(4x+1) \\
 \quad \quad 8x^2 + \overset{12x}{14x} \quad +3 \\
 \quad \quad \quad \quad x \quad -5 \\
 \hline
 \quad \quad -40x^2 - 70x - 15 \\
 \quad 8x^3 + 14x^2 + 3x \\
 \hline
 8x^3 - 26x^2 - 67x - 15
 \end{array}$$

$$\begin{array}{r}
 \textcircled{12} \quad (2x-1)(-2x+3) \\
 \quad \quad -4x^2 + 6x - 3 \\
 \quad \quad \quad \quad 4x + 5 \\
 \hline
 \quad \quad -20x^2 + 30x - 15 \\
 \quad -16x^3 + 24x^2 - 12x \\
 \hline
 -16x^3 + 4x^2 + 18x - 15
 \end{array}$$

+2x
6x

$$\begin{array}{r}
 \textcircled{13} \quad (-2x+5)(-x+2) \\
 \quad \quad 2x^2 - 9x + 10 \\
 \quad \quad \quad \quad 4x + 3 \\
 \hline
 \quad \quad 6x^2 - 27x + 30 \\
 \quad 8x^3 - 36x^2 + 40x \\
 \hline
 8x^3 - 30x^2 + 13x + 30
 \end{array}$$

-5x
-4x

$$(16) (pq+2)(pq+2)$$

$$p^2q^2 + 4pq + 4$$

$$(17) a) \quad \begin{array}{r} x^2 + 12x + 36 \\ 3x - 1 \end{array}$$

$$3x - 1$$

$$-x^2 - 12x - 36$$

$$3x^3 + 36x^2 + 108x$$

$$3x^3 + 35x^2 + 96x - 36$$