

Adding and Subtracting Polynomials Practice Problems

1. $(3x^2 + 7x - 1) + (x^2 + 3x + 5)$
2. $(4x^3 + 6x - 4) + (2x^2 - 2x + 9)$
3. $(x^3 + 2x^2 - x + 5) + (2x^3 - 3x^2 + 5x - 1)$
4. $(2x^2 + 9x + 8) + (3x^2 - 4x + 1)$
5. $(5x^3 - 2x^2 + 6x - 3) + (x^3 + 3x^2 + 7x + 4)$
6. $(4x^2 - 5x + 4) - (3x^2 - 3x - 6)$
7. $(3x^3 + 6x^2 - 2x + 3) - (2x^3 + 3x^2 - 6x - 5)$
8. $(2x^3 - 2x^2 + x - 1) - (6x^3 - 5x^2 + 7x + 9)$
9. $(5x^2 - 5x + 2) - (x^2 + 2x - 5)$
10. $(x^3 - 6x^2 + 4x - 5) - (4x^3 + 4x^2 - 9x + 1)$

Answers:

1. $4x^2 + 10x + 4$

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

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

4. $5x^2 + 5x + 9$

5. $6x^3 + x^2 + 13x + 1$

6. $x^2 - 2x + 10$

7. $x^3 + 3x^2 + 4x + 8$

8. $-4x^3 + 3x^2 - 6x - 10$

9. $4x^2 - 7x + 7$

10. $-3x^3 - 10x^2 + 13x - 6$

Multiplying by Distributing Practice Problems (Only one variable)

1. $(2x - 1)(3x^2 + 2x + 7)$

2. $(4a^2 + 2)(a^2 + 3)$

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

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

5. $4y(y^2 - 3)$

6. $(x + 2)(3x^2 - 5x + 3)$

7. $(c - 2)(c - 3)$

8. $(4x - 2)^2$

9. $(6x - 5)(x - 3) + (2x + 1)(2x - 1)$

10. $(3y - 6)(5y + 2)$

Answers:

1. $6x^3 + x^2 + 12x - 7$

2. $4a^4 + 14a^2 + 6$

3. $3x^2 + 8x - 3$

4. $8x^6 + 4x^5 - 6x^4 + 2x^3$

5. $4y^3 - 12y$

6. $3x^3 + x^2 - 7x + 6$

7. $c^2 - 5c + 6$

8. $16x^2 - 16x + 4$

9. $10x^2 - 23x + 14$

10. $15y^2 - 24y - 12$

Multiplying by Distributing Practice Problems (More than one variable)

1. $(x + 5y)(x - 7y)$

2. $(2x + 3y)(x - 6y)$

3. $(x - 4y)(x - y)$

4. $(5x + 5y)(x + y)$

5. $(3x + y)(2x - y)$

6. $(x + y)(6x - 4y)$

7. $(2x - y)(x - y)$

8. $(7x + 3y)(6x - 4y)$

9. $(x + y)(x - y)$

10. $(x - 5y)(x + 7y)$

Answers:

1. $x^2 - 2xy - 35y^2$
2. $2x^2 - 9xy - 18y^2$
3. $x^2 - 5xy - 4y^2$
4. $5x^2 + 10xy + 5y^2$
5. $6x^2 - xy - y^2$
6. $6x^2 + 2xy - 4y^2$
7. $2x^2 - 3xy + y^2$
8. $42x^2 - 10xy - 12y^2$
9. $x^2 - y^2$
10. $x^2 + 2xy - 35y^2$

Factoring Completely (binomials and trinomials with a GCF)

1. $5x - 25x^2$

2. $6x^3 - 18x^2$

3. $2x^3 - 18x^2 - 72x$

4. $m^3 - 3m^2 - 18m$

5. $28x + 35x^3$

6. $3x^3 - 12x^2 - 63x$

7. $5x^3 + 90x$

8. $4x^7 - 32x^4$

9. $n^3 + 2n^2 - 15n^2$

10. $4x^3 + 8x^2 - 32x$

Answers:

1. $5x(1 - 5x)$
2. $6x^2(x - 3)$
3. $2x(x - 12)(x + 3)$
4. $m(m - 6)(m + 3)$
5. $7x(4 + 5x^2)$
6. $3x(x - 7)(x + 3)$
7. $5x(x^2 + 18)$
8. $4x^4(x^3 - 8)$
9. $n(n + 5)(n - 3)$
10. $4x(x + 4)(x - 2)$

Factoring Completely (Binomials with NO GCF)

1. $x^2 - 64$

2. $x^2 - 36$

3. $16x^2 - 4$

4. $x^2 - 81$

5. $25x^2 - 16$

6. $49x^2 - 36$

7. $x^2 - 4$

8. $4x^2 - 25$

9. $x^2 - 49$

10. $81x^2 - 100$

Answers:

1. $(x - 8)(x + 8)$
2. $(x + 6)(x - 6)$
3. $(4x - 2)(4x + 2)$
4. $(x - 9)(x + 9)$
5. $(5x - 4)(5x + 4)$
6. $(7x - 6)(7x + 6)$
7. $(x - 2)(x + 2)$
8. $(2x - 5)(2x + 5)$
9. $(x + 7)(x - 7)$
10. $(9x - 10)(9x + 10)$

Factoring Trinomials (With NO GCF and a leading coefficient of 1)

1. $x^2 + 2x - 8$

2. $x^2 - 10x + 24$

3. $x^2 + 2x - 48$

4. $x^2 - 14x + 40$

5. $x^2 - 5x - 14$

6. $x^2 + 11x + 24$

7. $x^2 + 3x - 18$

8. $x^2 - x - 30$

9. $x^2 - 13x + 42$

10. $x^2 + 13x + 36$

Answers:

1. $(x + 4)(x - 2)$
2. $(x - 6)(x - 4)$
3. $(x + 8)(x - 6)$
4. $(x - 10)(x - 4)$
5. $(x - 7)(x + 2)$
6. $(x + 8)(x + 3)$
7. $(x + 6)(x - 3)$
8. $(x - 6)(x + 5)$
9. $(x - 7)(x - 6)$
10. $(x + 4)(x + 9)$

Factoring a Trinomial (With NO GCF and a leading coefficient greater than 1)

1. $2x^2 + 7x + 3$

2. $2x^2 - 12x + 10$

3. $2x^2 + 9x - 5$

4. $2x^2 - 12x + 10$

5. $2x^2 + 7x - 15$

6. $2x^2 + 5x - 3$

7. $3x^2 + 5x + 2$

8. $3x^2 + 13x + 4$

9. $3x^2 + 11x - 4$

10. $3x^2 + 11x + 10$

Answers:

1. $(x + 3)(2x + 1)$
2. $(x - 2)(2x - 5)$
3. $(2x - 1)(x + 5)$
4. $(2x - 2)(x - 5)$
5. $(2x - 3)(x + 5)$
6. $(x + 3)(2x - 1)$
7. $(3x + 2)(x + 1)$
8. $(x + 4)(3x + 1)$
9. $(x + 4)(3x - 1)$
10. $(3x + 5)(x + 2)$

Factor or distribute, then solve.

1. $x^2 - 12x + 35$

2. $2x^2 + 15x + 7$

3. $36x^2 - 16x$

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

5. $(x + 3)(x - 5) = x(x - 4)$

6. $x^2 - 12x + 27$

7. $x^2 + 2x - 24$

8. $(x + 2)(x + 7) = x(x - 4)$

9. $2x^2 + x - 10$

10. $16x^2 - 25x$

Answers:

1. $(x - 5)(x - 7)$ $x = 5, x = 7$
2. $(x + 7)(2x + 1)$ $x = -7, x = -1/2$
3. $4x(9x - 4)$ $x = 0, x = 4/9$
4. $(x + 6)(x^2 - 1)$ $x = -6, x = 1$
5. $x = 15/2$
6. $(x - 9)(x - 3)$ $x = 9, x = 3$
7. $(x + 6)(x - 4)$ $x = -6, x = 4$
8. $x = -14/15$
9. $(2x + 5)(x - 2)$ $x = -\frac{5}{2}, x = 2$
10. $x(4x - 5)(4x + 5)$ $x = 0, x = \frac{5}{4}, x = -\frac{5}{4}$