

Solutions

5.1 Multiplying and Special Products

5.1.1. Expand $(x + 4)^2$.

Solution. $x^2 + 2(x)(4) + 16 = x^2 + 8x + 16$.

5.1.2. Expand $(3x + 2)(x - 5)$.

Solution. $3x^2 - 15x + 2x - 10 = 3x^2 - 13x - 10$.

5.1.3. Simplify $(x - 7)(x + 7)$.

Solution. The conjugate factors give a difference of squares: $x^2 - 49$.

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5.2 Greatest Common Factor

5.2.1. Factor $10x^2 + 15x$.

Solution. The greatest common factor is $5x$, so the result is $5x(2x + 3)$.

5.2.2. Factor $8a^3b - 12a^2b^2$.

Solution. The common factor is $4a^2b$. The result is $4a^2b(2a - 3b)$.

5.2.3. Factor $3x^2 - 27$ completely.

Solution. First factor out 3: $3(x^2 - 9)$. Then use a difference of squares: $3(x - 3)(x + 3)$.

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5.3 Factoring Quadratics

5.3.1. Factor $x^2 - x - 12$.

Solution. The numbers -4 and 3 multiply to -12 and add to -1 . The result is $(x - 4)(x + 3)$.

5.3.2. Factor $3x^2 + 11x + 6$.

Solution. The factorization is $(3x + 2)(x + 3)$, since the middle terms sum to $11x$.

5.3.3. Factor $2x^2 - 18$ completely.

Solution. $2(x^2 - 9) = 2(x - 3)(x + 3)$.