

Intermediate Algebra

Skill-Builder # AE - 7

Writing a Polynomial Multiplication Problem as a Binomial Multiplication Problem

Strategy: Use either shapes or letters to reduce the multiplication problem to one of the following forms and apply the corresponding formula:

(Binomial A)(Binomial B) $(\square + \circ)(\diamond + \nabla) = \square\diamond + \square\nabla + \circ\diamond + \circ\nabla$

(Binomial A +)(Binomial A -) $(\square + \bullet)(\square - \bullet) = \square^2 - \bullet^2$

Square of Binomial + $(\square + \bullet)^2 = \square^2 + 2\square\bullet + \bullet^2$

Square of Binomial - $(\square - \bullet)^2 = \square^2 - 2\square\bullet + \bullet^2$

Examples

1. $[(x+1)-y][(x+1)+y] = [\boxed{x+1} - \circled{y}][\boxed{x+1} + \circled{y}] = \boxed{(x+1)}^2 - \circled{y}^2$

2. $[(a+3)+b][c+(d-1)] = [\boxed{a+3} + \circled{b}][\diamond c + \nabla(d-1)] = \boxed{a+3}\diamond c + \boxed{a+3}\nabla(d-1) + \circled{b}\diamond c + \circled{b}\nabla(d-1)$

3. $[n+(m-p)]^2 = [\boxed{n} + \circled{m-p}]^2 = \boxed{n}^2 + 2\boxed{n}\circled{m-p} + \circled{m-p}^2$

4. $[(y+4)-(x-5)]^2 = [\boxed{y+4} - \circled{x-5}]^2 = \boxed{y+4}^2 - 2\boxed{y+4}\circled{x-5} + \circled{x-5}^2$

One can also use letters:

1. $\left[\underbrace{(x+1)-y}_a \right] \left[\underbrace{(x+1)+y}_a \right] = (a-y)(a+y) = a^2 - y^2 = (x+1)^2 - y^2$

2. $\left[\underbrace{(a+3)+b}_x \right] \left[\underbrace{c+(d-1)}_y \right] = (x+b)(c+y) = xc + xy + bc + by = (a+3)c + (a+3)y + bc + b(d-1)$

3. $\left[\underbrace{n+(m-p)}_x \right]^2 = (n+x)^2 = n^2 + 2nx + x^2 = n^2 + 2n(m-p) + (m-p)^2$

4. $\left[\underbrace{(y+4)-x}_a \right] \left[\underbrace{(y+4)+x}_b \right] = (a-x)(a+x) = a^2 - x^2 = (y+4)^2 - 2(y+4)x + x^2$

Intermediate Algebra**Skill-Builder # AE - 7****Writing a Polynomial Multiplication Problem as a Binomial Multiplication Problem**

Use either shapes or letters to rewrite the given multiplication problem as a binomial multiplication problem.

1. $[a - (b + 2)]^2$

2. $[(x + y) + 4n][(x + y) - 4n]$

3. $[(n - 1) + 2m][(n + 1) - 3m]$

4. $[(b - 2) - (a - c)]^2$

5. $[x + (2y - 1)][(x + 1) - 5y]$

6. $[(p + q) - (r + s)][(p + q) + (r + s)]$

7. $[4y + (x - 1)]^2$

8. $[(2a - b) - (3c + 4d)]^2$

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Answers

Using letters:

1. $(x - y)^2$

2. $(a + b)(a - b)$

3. $(a + b)(c - d)$

4. $(x - y)^2$

5. $(a + b)(c - d)$

6. $(a + b)(a - b)$

7. $(a + b)^2$

8. $(x - y)^2$

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