

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) $(\square + \bigcirc)(\blacklozenge + \blacktriangledown) = \square\blacklozenge + \square\blacktriangledown + \bigcirc\blacklozenge + \bigcirc\blacktriangledown$

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

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

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

Examples

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

2. $[(a+3) + b][c + (d-1)] = [\boxed{a+3} + \bigcirc b][\bigcirc c + \blacktriangledown d-1] = \boxed{a+3}\blacklozenge c + \boxed{a+3}\blacktriangledown d-1 + \bigcirc b\blacklozenge c + \bigcirc b\blacktriangledown d-1$

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

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

One can also use letters:

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

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

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

4. $\left[\underbrace{(y+4)}_a - \underbrace{(x-5)}_b\right]^2 = (a-b)^2 = a^2 - 2ab + b^2 = (y+4)^2 - 2(y+4)(x-5) + (x-5)^2$

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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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