FMP10
Special Binomial Products

Name KEY

Part I – Conjugate Products

1) Multiply using double distribution:

$(x+3)(x-3)$

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

$= x^2 - 9$

$(2x-5)(2x+5)$

$4x^2 + 10x - 10x - 25$

$= 4x^2 - 25$

2) Try to identify a pattern to this type of binomial multiplication question. Make up a question and solve it using your pattern.

Varies

- product of two binomials that differ only by the sign between
- the middle terms always cancel out

3) Multiply $(a-b)(a+b)$ to create an algebraic formula for this type of binomial multiplication.

$= a^2 - b^2$

4) Use your pattern and/or the formula to multiply the following more quickly than double distribution:

$(x+4)(x-4)$

$x^2 - 4^2$

$= x^2 - 16$

$(x-9)(x+9)$

$x^2 - 9^2$

$= x^2 - 81$

$(3x+7)(3x-7)$

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

$= 9x^2 - 49$

$(x^3 - 2y)(x^3 + 2y)$

$(x^3)^2 - (2y)^2$

$= x^6 - 4y^2$

5) Could you apply the pattern/formula to each product, explain:

$(x+6)(x+6)$

no, same sign between

$(3x-7)(2x+7)$

no, terms different

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Part II – Binomial Squares

1) Multiply using double distribution:

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

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

$x^2+3x+3x+9$ $4x^2-10x-10x+25$

$=x^2+6x+9$ $=4x^2-20x+25$

2) Try to identify a pattern to this type of binomial multiplication question. Make up a question and solve it using your pattern.

- binomial times itself

Varies - square each term and double the product of the terms

3) Multiply $(a-b)^2$ and $(a+b)^2$ to create algebraic formulas for this type of binomial multiplication.

$(a-b)^2=a^2-2ab+b^2$ $(a+b)^2=a^2+2ab+b^2$

4) Use your pattern and/or the formula to multiply the following more quickly than double distribution:

$(x+4)^2$ $(x-9)^2$ $(3x+2)^2$ $(5x-3)^2$

$x^2+2(x)(4)+4^2$ $x^2+2(x)(-9)+(-9)^2$ $2(3x)(2)$ $2(5x)(-3)$

$=x^2+8x+16$ $=x^2-18x+81$ $(3x)^2$ 2^2 $(5x)^2$ $(-3)^2$

$=9x^2+12x+4$ $25x^2-30x+9$

5) Could you apply the pattern/formula to each product, explain:

$(x+6)(x-6)$ $(3x-7)^3$

no, signs different no, not square