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| **Content: Adding and Subtracting Polynomials** | | | |
| Adds polynomials concretely by combining like terms and removing zero pairs  (*x*2 ‒2*x* + 1) + (*x*2 + 3*x* ‒ 2)  A diagram of a graph  Description automatically generated  “I modelled the polynomials with tiles, and removed zero pairs, leaving 2*x*2 + *x* ‒ 1.” | Adds polynomials symbolically by adding the numerical coefficients  (*x*2 ‒2*x* + 1) + (*x*2 + 3*x* ‒ 2)  “I added the numerical coefficients of like terms.  1*x*2 + 1*x*2 = 2*x*2  –2*x* + 3*x* = 1*x* 1 ‒ 2 = ‒1  So, the sum is 2*x*2 + *x* ‒ 1.” | Subtracts polynomials concretely by adding zero pairs as needed  (2*x*2 + *x*) ‒ (‒3*x*)  “To subtract ‒3*x*, I added 3 zero pairs of *x*-tiles as there were no ‒*x*- tiles to take away.    The result is 2*x*2 + 4*x*.” | Flexibly adds and subtracts polynomials symbolically, thinks of subtraction as adding the opposite  “To subtract (*a*²  4*a* + 4)  (7*a*²   2*a* + 5), I added the opposite:  (*a*²  4*a* + 4) + (7*a*² + 2*a*  5) = 8*a*²   2*a*  1.” |
| **Observations/Documentation** | | | |
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| **Competency: Connecting** | | | |
| Connects size and shape of algebra tiles with like terms  “I know 2*x*2 and ‒3*x*2 are like terms because the tiles used to represent them have the same size and shape.” | When adding polynomials, connects like terms with different colours or with opposite signs to zero pairs    “To add (*x*2 ‒2*x* + 1) and  (*x*2 + 3*x* ‒ 2), I can remove pairs of tiles with the same size and shape but different colours. I am left with 2*x*2 + *x* ‒ 1.” | Adds and subtracts polynomials, making connections between the operations  “I know that when subtracting polynomials, I can add the opposite. So, (5*m*² + 4*m*  3)  (*2m²*  6*m* + 1) is the same as (5*m*² + 4*m*  3) + (2*m*² + 6*m*  1), which simplifies to 3*m*² + 10*m*  4.” | Connects understanding of adding and subtracting polynomials to real- world situations  “Carmen walks dogs for $25 per dog and feeds cats for $5 per cat.  Carmen buys $30 worth of dog treats and cat food for $1.65 per cat.  25*d* + 5*c*  30  1.65*c* represents the amount of money Carmen makes for walking *d* dogs and feeding *c* cats.  The expression simplifies to 25*d* + 3.35*c*  30.” |
| **Observations/Documentation** | | | |
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