CCSS Algebra 4 AA6: Polynomials Introduction (Part 1) Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Show that $28⋅27=(20+8)(20+7)$ using an area model. What do the numbers you placed inside the four rectangular regions you drew represent?

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2. Use an area model to multiply each expression below and combine like terms.
a. $(x+8)(x+7)$ b. $(x^{2}+3x+1)(x^{2}-5x+2)$ c. $(x^{2}+3x+1)(x^{2}-2)$

3. Have each of your team member complete one of the products below using an area model.

a. $(x-1)(x+1)$

b. $(x-1)(x^{2}+x+1)$

c. $(x-1)(x^{3}+x^{2}+x+1)$

d. $(x-1)(x^{4}+x^{3}+x^{2}+x+1)$

4. Based on your answer to #3, without using an area model, what is $(x-1)(x^{20}+x^{19}+...+x^{2}+x+1)=$?

5. Generalize the pattern that emerges by writing down an identity for $(x-1)(x^{n}+x^{n-1}+x^{n-2}+...+x^{2}+x+1)\_{}$

6. Multiply $(x-y)(x^{3}+x^{2}y+xy^{2}+y^{3})$using an area model. Combine like terms and simplify your answer.

7. Multiply $(x^{2}-y^{2})(x^{2}+y^{2})$using an area model and combine like terms.

8. Multiply $(x^{5}-y^{5})(x^{5}+y^{5})$using an area model and combine like terms.

9. Generalize the pattern that emerges to write down an identity for $(x^{n}-y^{n})(x^{n}+y^{n})$.