

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



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 members 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 $(x - 1)(x^{20} + x^{19} + \dots + x^2 + x + 1) = ?$

5. Generalize the pattern that emerges by writing down an identity for

$$(x - 1)(x^n + x^{n-1} + x^{n-2} + \dots + x^2 + x + 1)$$

