

**Challenge: Skills and Applications**

For use with pages 9–14

**Evaluate each expression for the given values of the variables.**

- $a^n$  when  $a = 4$  and  $n = 3$
- $(a - 5)^n$  when  $a = 7$  and  $n = 5$
- $(9 - a)^n$  when  $a = 6$  and  $n = 4$

**Find the value of  $n$  in each.**

- $2^n = 16$
- $3^n = 9$
- $10^n = 10,000,000$
- $5^n = 625$
- If  $3^{-2} = \frac{1}{9}$ , what do you think  $4^{-2}$  equals?
- If  $\left(\frac{1}{2}\right)^{-3} = 8$ , what do you think  $\left(\frac{1}{2}\right)^{-4}$  equals?

**For Exercises 10–12, use the following figures.**

Figure 1

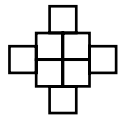


Figure 2

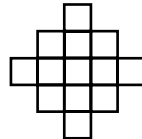


Figure 3

- Copy the first three figures on graph paper. Then draw the fourth and the fifth figures of the sequence.
- Look for a pattern in the areas of the figures and complete the table.

<b>Figure</b>	1	2	3	4	5
<b>Area</b>	5	8	13		
<b>Pattern</b>					

- Write an expression using an exponent for the area of the  $n$ th figure.