

## Problem Set

1. You forward an e-card that you found online to three of your friends. They liked it so much that they forwarded it on to four of their friends, who then forwarded it on to four of their friends, and so on. The number of people who saw the e-card is shown below. Let  $S_1$  represent the number of people who saw the e-card after one step, let  $S_2$  represent the number of people who saw the e-card after two steps, and so on.

$$S_1 = 3$$

$$S_2 = 3 + 3 \cdot 4$$

$$S_3 = 3 + 3 \cdot 4 + 3 \cdot 4^2$$

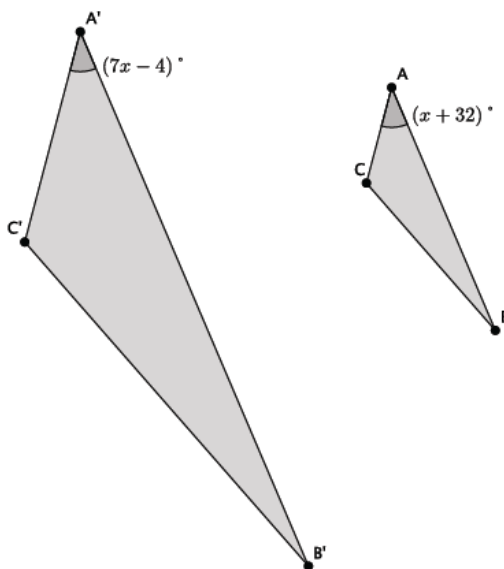
$$S_4 = 3 + 3 \cdot 4 + 3 \cdot 4^2 + 3 \cdot 4^3$$

- Find the pattern in the equations.
- Assuming the trend continues, how many people will have seen the e-card after 10 steps?
- How many people will have seen the e-card after  $n$  steps?

For each of the following questions, write an equation, and solve to find each answer.

- Lisa has a certain amount of money. She spent \$39 and has  $\frac{3}{4}$  of the original amount left. How much money did she have originally?
- The length of a rectangle is 4 more than 3 times the width. If the perimeter of the rectangle is 18.4 cm, what is the area of the rectangle?
- Eight times the result of subtracting 3 from a number is equal to the number increased by 25. What is the number?
- Three consecutive odd integers have a sum of 3. What are the numbers?
- Each month, Liz pays \$35 to her phone company just to use the phone. Each text she sends costs her an additional \$0.05. In March, her phone bill was \$72.60. In April, her phone bill was \$65.85. How many texts did she send each month?
- Claudia is reading a book that has 360 pages. She read some of the book last week. She plans to read 46 pages today. When she does, she will be  $\frac{4}{5}$  of the way through the book. How many pages did she read last week?

8. In the diagram below,  $\triangle ABC \sim \triangle A'B'C'$ . Determine the measure of  $\angle A$ .



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