Assignment

Write

Explain what it means for a pattern to be a function.

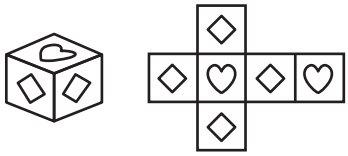
Remember

Sequences can be used to show observable patterns. Patterns can be used to solve problems.

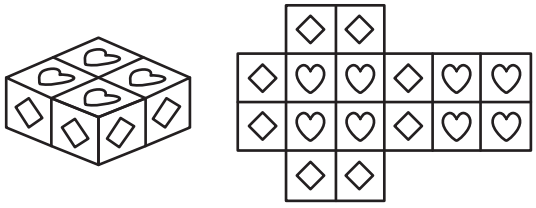
Practice

1. A jewelry box company offers simple jewelry boxes with decorative tiles. The top and bottom of each box are adorned with heart tiles while the sides consist of diamond tiles. Pictures of the first 3 jewelry box designs and their corresponding tile layouts are shown.

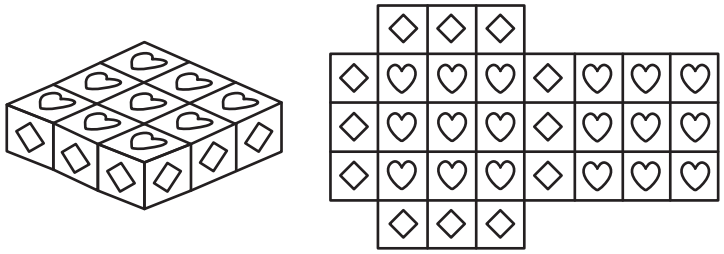
Design 1



Design 2



Design 3

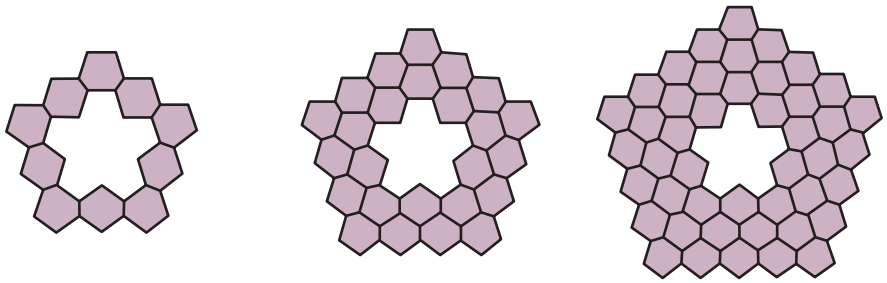


a. Sketch the tile layout for Design 4.
b. Analyze the jewelry box designs. Describe as many patterns as you can.
c. Determine a method you can use to calculate the number of diamond tiles, the number of heart tiles, and the total number of tiles used for any design.
d. The company has 4 times as many heart tiles as they have diamond tiles in their inventory. The owner decides to advertise a sale on the box design, which uses 4 times as many heart tiles as diamond tiles. Determine which design the owner will place on sale.

2. Susan starts her own telemarketing company by recruiting 3 employees into what she calls Recruiting Group 1. She requires each employee in Recruiting Group 1 to recruit 3 additional employees for Recruiting Group 2. The employees in each successive recruiting group must meet the same requirement of recruiting 3 additional employees.
   a. Create a visual model to represent the number of employees in the company. Only include the first 3 recruiting groups in your model. Do not include Susan as an employee.
   b. Determine a method to calculate the number of employees in any given recruiting group. Use that method to calculate the number of employees hired in each of the first 6 recruiting groups.
   c. Susan can only afford to hire a total of 800 employees. She tells the employees to halt all recruiting as soon as the 800th employee is hired. Which recruiting group will be partially completed at that time? Explain your reasoning.

Stretch

Students in an art class are constructing a tile mural. The students add to the mural each week. The design of the mural is shown for the first 3 weeks.



Week 1 Week 2 Week 3

Define a function to represent the number of tiles on the mural in any week.

Review

Solve each equation for the unknown.

1. $3(5x - 4) - 2 = 10 - 3x$
2. $-6a - 4(a - 3) = -6a + 15$