Task 1: Growing Rectangles (Hershkowitz and Schwarz, (1999))

Each of the following three families of rectangles has its growth pattern.

**Family A**

Second Year

Third Year

First Year

8

8

8

3

1

2

**Family B**

Third

Year

Second

Year

2

3

1

First

Year

3

1

2

**Family C**

1/4

Second Year

First Year

1/4

4

2

Third Year

1/4

8

In Family A the width grows each year by one unit: the length remains the same at 8 units. In Family B, the width and length of the rectangle each grow by one unit each year. In Family C the length doubles each year, and the width remains equal to ¼.

Try to find various hypotheses comparing change in area, perimeter, etc. For example, answer the following questions: In which family will the area be largest and when? When will the area of each family exceed 1000 u2? Check your hypotheses with the tools available and explain.

Task 2: Guess my rule

1. Mark and Raymond are playing Guess My Rule.

When Mark gives an input of 2, Raymond gives an output of

When Mark gives an input of 5, Raymond gives an output of

When Mark gives an input of 10, Raymond gives an output of

What could be Raymond’s rule?

Explain how you thought about it.

2. Amy has this rule: square the input then subtract 1 or add 4 depending on a coin flip (heads subtract 1, tails add 4), what are some inputs and output pairs?

Angelica gives an input of 6, what should be the output?

James gave Amy an input and she replied with an output of 8. What could have been James’ input?

3.a. Create a rule whose output is 5 when the input is 8.

b. Create a *different* rule whose output is 5 when the input is 8 (try to be creative!).

c. Provide a table of at least 5 input values and their corresponding output values for each of your rules above and be ready to trade with another group to have them guess your rules.

4. Guess the rules given to you by the other group. How are the rules different and how are they the same?

Task 3: The Customer (Illustrative Mathematics Project)

A certain business keeps a database of information about its customers.

1. Let *C* be the rule which assigns to each customer shown in the table his or her home phone number. Is *C* a function? Explain your reasoning.

|  |  |
| --- | --- |
| **Customer Name** | **Home Phone Number** |
| Heather Garcia | 3105100091 |
| Mike London | 3105200256 |
| Sue Green | 3234132598 |
| Alex Timofeyev | 3234132598 |
| Michelle Metz | 2138061124 |

1. Let *P* be the rule which assigns to each phone number in the table above, the customer name(s) associated with it. Is *P* a function? Explain your reasoning.
2. Explain why a business would want to use a person's social security number as a way to identify a particular customer instead of their phone number.