Function Activity*

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1. Write down what you think a function is.

2. Provide at least three rules for the following table. State the rules in English.

In	Out
1	3
2	5

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3. (a) What is the definition of an equivalence relation on a set X?
   (b) What are some natural equivalence relations on fractions, on line segments, on triangles, on squares, on arbitrary polygons?
   (c) Suppose $f : X \to Y$ is a function. What is a natural equivalence relation on X associated with X?

4. a) Tony suggests that mapping every integer to 4 is not a function because the output doesn't actually depend on the input. Is he correct?

   b) Peggy Sue suggests that mapping each real number to $\sqrt{2}$ is not a function because she can't actually compute the output. Is she correct?

   c) Sasha suggests that mapping each rational number to itself is not a function because the rule does not change its input. Is she correct?

   d) Henry considers the following rule The set of inputs is integers. Given an input number, flip a coin. If the result is heads double the input number; if the result is tails, the output is 1. Does this rule define a function?

   e) rule: INPUT: a letter of the English output, OUTPUT: any word beginning with that letter. Does this rule define a function?

   f) rule: INPUT: the number of a row in a spreadsheet. OUTPUT: the number in column J on that row. Does this rule define a function?

   g) rule: INPUT: The lengths of two touching sides of a rectangle. OUTPUT: the area of the rectangle. Does this rule define a function?