Find a rule – two step

1. Use the function machine to complete the table.

<table>
<thead>
<tr>
<th>Input</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>10</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Here is the same function machine with the steps in the reverse order.

<table>
<thead>
<tr>
<th>Input</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>10</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The outputs will be the same.

Teddy

The outputs will be different.

Jack

3. Work out the missing outputs and inputs.

   a) input 1 → 5 → + 2 → output
      5 → 5 → + 2 → output
      8 → 5 → + 2 → output
      39 → 5 → + 2 → output

   b) input 3 → 5 → – 4 → output
      4 → 5 → – 4 → output
      20 → 5 → – 4 → output
      51 → 5 → – 4 → output

   c) input 13 → – 3 → + 2 → output
      3 → – 3 → + 2 → output
      12 → – 3 → + 2 → output
      8 → – 3 → + 2 → output

Who is correct? ____________
4. Tick the pairs of function machines that will give the same outputs for a given input.
   a) 
   ![Function machine diagram]
   
   b) 
   ![Function machine diagram]
   
   c) 
   ![Function machine diagram]

Explain your reasoning to a partner.

5. Here are some 2-step function machines.
   For each machine, write a single step that would give the same output.
   Check your answers by inputting values.
   a) 
   ![Function machine diagram]
   
   b) 
   ![Function machine diagram]
   
   Can all 2-step function machines be written as a 1-step function machine?
   Talk about it with a partner.

6. Here is a function machine.
   
   a) 
   ![Function machine diagram]
   
   b) 
   Rosie puts a number into the machine and she gets out the same number.
   Work out Rosie’s number.

7. Mr Hall and Mrs Rose order some photos online.
   a) Mr Hall orders 16 photos.
   How much does he pay?

   b) Mrs Rose pays £6.05
   How many photos did she order?