Graphing Transformations Techniques - Team Project Packet AB

This packet is to be completed by Student A and Student B working together in the same place at the same time. It should be completed after Student A completes packet A and Student B completes packet B.

**Problem AB1**

Write the function whose graph is the graph of \( y = \frac{1}{x} \), but is compressed towards the y-axis using an “a” value of 4.

Step 1: Identify the transformation type:  __________________________________________________________

Step 2: Identify what you are being asked to create: (Circle One)

A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________

Final Answer: ________________________________________________________________________________

**Problem AB2**

Start with the function \( y = \frac{1}{x} \) and make two consecutive transformations. First, compress it towards the y-axis using an “a” value of 4. Then, spin it around the y-axis. What is the resulting equation?

Step 1: Identify the transformation **types**:  _________________________________________________________

Step 2: Identify what you are being asked to create: (Circle One)

A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________

___________________________________________________________________________________________

Final Answer: ________________________________________________________________________________
Problem AB3
Write the function whose graph is the graph of \( y = x \), but is stretched away from the y-axis using an “\( a \)” value of \( \frac{1}{4} \).

Step 1: Identify the transformation type: __________________________________________________________

Step 2: Identify what you are being asked to create: (Circle One)

A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________

Final Answer: ________________________________________________________________________________

Problem AB4
Start with the function \( y = x \) and make two consecutive transformations. First, stretch it away from the y-axis using an “\( a \)” value of \( \frac{1}{4} \). Then, shift it right 3 units. What is the resulting equation?

Step 1: Identify the transformation types:  _________________________________________________________

Step 2: Identify what you are being asked to create: (Circle One)

A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________

___________________________________________________________________________________________

Final Answer: ________________________________________________________________________________
**Problem AB5**
Start with the function \( y = \sqrt{x} \) and make two consecutive transformations. First, spin it around the \( y \)-axis. Then, spin it around the \( x \)-axis. What is the resulting equation?

Step 1: Identify the transformation **types**: 

Step 2: Identify what you are being asked to create: (Circle One)  
A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

Final Answer: 

**Problem AB6**
Start with the function \( y = |x| \) and make two consecutive transformations. First, shift it left 2 units. Then, shift it up 7 units. What is the resulting equation?

Step 1: Identify the transformation **types**: 

Step 2: Identify what you are being asked to create: (Circle One)  
A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

Final Answer: 


In the next four problems, you will transform the same graph/points in four different ways. Pay attention to the details. In problem...

...AB7 you will turn \( f(x) \) into \( f(2x) \)

...AB8 you will turn \( f(x) \) into \( \frac{f(1)}{2}x \)

...AB9 you will turn \( f(x) \) into \( 2f(x) \)

...AB10 you will turn \( f(x) \) into \( \frac{1}{2}f(x) \)

Be sure to learn how to recognize the four different transformations represented above.

Problem AB7
Consider the graph of \( y = f(x) \) on the right.
Use the graph of \( f \) to complete the table and graph \( y = f(2x) \) on the same grid.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-6</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>-2</td>
<td>2</td>
<td></td>
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<td>0</td>
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<td></td>
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</tr>
<tr>
<td>2</td>
<td>-2</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 1: Identify the transformation type: ____________________________________________________________________________

Step 2: Identify what you are being asked to create: (Circle Two)

A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________
___________________________________________________________________________________________

Final Answer: (Complete the table above and create the new graph on the same grid)
Problem AB8
Consider the graph of \( y = f(x) \) on the right.

Use the graph of \( f \) to complete the table and graph \( y = \left[ f\left( \frac{1}{2} x \right) \right] \) on the same grid.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-6</td>
<td>2</td>
<td>-6</td>
<td>2</td>
</tr>
<tr>
<td>-2</td>
<td>2</td>
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<td>-2</td>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>6</td>
<td>-2</td>
<td>6</td>
<td>-2</td>
</tr>
</tbody>
</table>

Step 1: Identify the transformation type: ____________________________________________________________

Step 2: Identify what you are being asked to create: (Circle Two)

A function/equation  A set of coordinates  A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________
___________________________________________________________________________________________

Final Answer: (Complete the table above and create the new graph on the same grid)
**Problem AB9**

Consider the graph of \( y = f(x) \) on the right.

Use the graph of \( f \) to complete the table and graph \( y = 2f(x) \) on the same grid.

<table>
<thead>
<tr>
<th>( y = f(x) )</th>
<th>( y = 2f(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( x )</td>
<td>( y )</td>
</tr>
<tr>
<td>-6</td>
<td>2</td>
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<tr>
<td>-2</td>
<td>2</td>
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<tr>
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<td>0</td>
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<tr>
<td>2</td>
<td>-2</td>
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<tr>
<td>6</td>
<td>-2</td>
</tr>
</tbody>
</table>

Step 1: Identify the transformation type: __________________________________________________________

Step 2: Identify what you are being asked to create: (Circle **Two**)

- A function/equation
- A set of coordinates
- A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

___________________________________________________________________________________________
___________________________________________________________________________________________

Final Answer: (Complete the table above and create the new graph on the same grid)
**Problem AB10**

Consider the graph of \( y = f(x) \) on the right.

Use the graph of \( f \) to complete the table and graph \( y = \frac{1}{2} f(x) \) on the same grid.

<table>
<thead>
<tr>
<th>( y = f(x) )</th>
<th>( y = \frac{1}{2} f(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( x )</td>
<td>( y )</td>
</tr>
<tr>
<td>−6</td>
<td>2</td>
</tr>
<tr>
<td>−2</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>2</td>
<td>−2</td>
</tr>
<tr>
<td>6</td>
<td>−2</td>
</tr>
</tbody>
</table>

Step 1: Identify the transformation type:  

Step 2: Identify what you are being asked to create: (Circle **Two**)

- A function/equation
- A set of coordinates
- A graph

Step 3: Based on your answer to Step 2, write the associated characteristics that will help you solve the problem:

-  
-  

Final Answer: (Complete the table above and create the new graph on the same grid)