**Notes**

The following graph represents the amount of water in a holding tank, *G(t)*, as a function of time in hours, *t*,since 8 a.m.. The homeowner begins watering at 11 a.m. and finishes watering at 3 p.m.

**Water in a Holding Tank**



1. Evaluate . Include units in your answer.
2. Interpret your answer to #1 in a complete sentence.
3. Suppose that the homeowner wants to increase the amount of water in the holding tank at any given time by 1 gallon. Sketch a graph (above) of the new function, *N(t)*.
4. Write an equation for the new function, *N(t)*, in terms of the original function *G(t)*.

*N(t)=*

1. Did the transformation in questions 3 and 4 involve a change to the input or output?
2. Let  be a new function.
   1. Describe the transformation (e.g. shift up, shift down, etc.).
   2. Interpret what this equation means in the context of the situation.
3. Instead of increasing the amount of water in the holding tank, the homeowner has decided to start watering her plants 1 hour earlier (yet still water for the same amount of time, etc.). Sketch the graph (below) of the resulting function, *L(t)*.

**Water in a Holding Tank**



1. Evaluate . Include units in your answer.
2. Evaluate . Include units in your answer.
3. Circle all choices below that are true:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. Write an equation for the function, *L(t)*, in terms of the original function *G(t)* (Hint: Use what you know is true in #7 and #10 to help).

*L(t)*=

1. Did the transformation in #11 involve a change to the input or output?
2. Describe the transformation (e.g. shift up, shift down, etc.) that would take place for a scenario that involves watering the plants 1 hour later and increasing the amount of water in the holding tank at any given time by 3 gallons.
3. Write an equation, *M(t)*, in terms of the original function *G(t)* for the scenario given in #13.

*M(t)=*

1. Let be the function whose graph is given below.



1. Fill in the table below for *f(x)* where possible. If not possible, write NP in the box.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* | −4 | −2 | 0 | 2 | 4 |
| *f(x)* |  |  |  |  |  |

1. Fill in the table below for where possible. If not possible, write NP in the box.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* | −4 | −2 | 0 | 2 | 4 |
|  |  |  |  |  |  |

1. Plot the points from the table in **part b** on the graph above and then describe the transformation that took place.
2. Fill in the table below for where possible. If not possible, write NP in the box.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* | −4 | −2 | 0 | 2 | 4 |
|  |  |  |  |  |  |

1. Plot the points from the table in **part d** on the graph above and then describe the transformation that took place.**Summary – Transformations**

Let  be the original function (parent function).

|  |  |
| --- | --- |
| Transformed Function  (child function) | Description of Transformation |
|  |  |
|  |  |
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