## Unit 5 Lesson 2: Moving Functions

### 1 What Happened to the Equation? (Warm up)

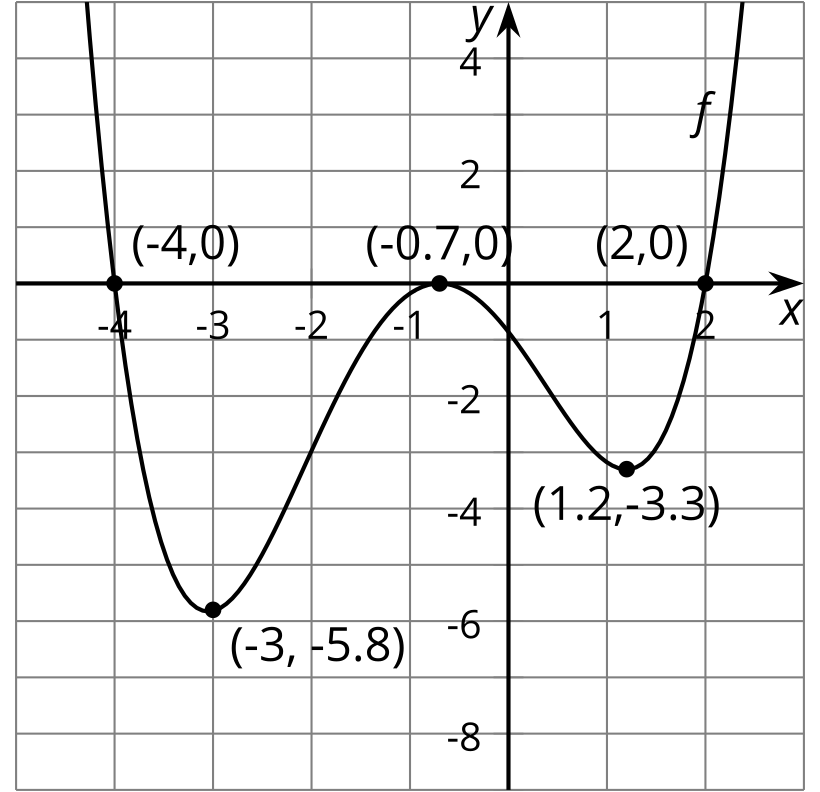
#### Student Task Statement

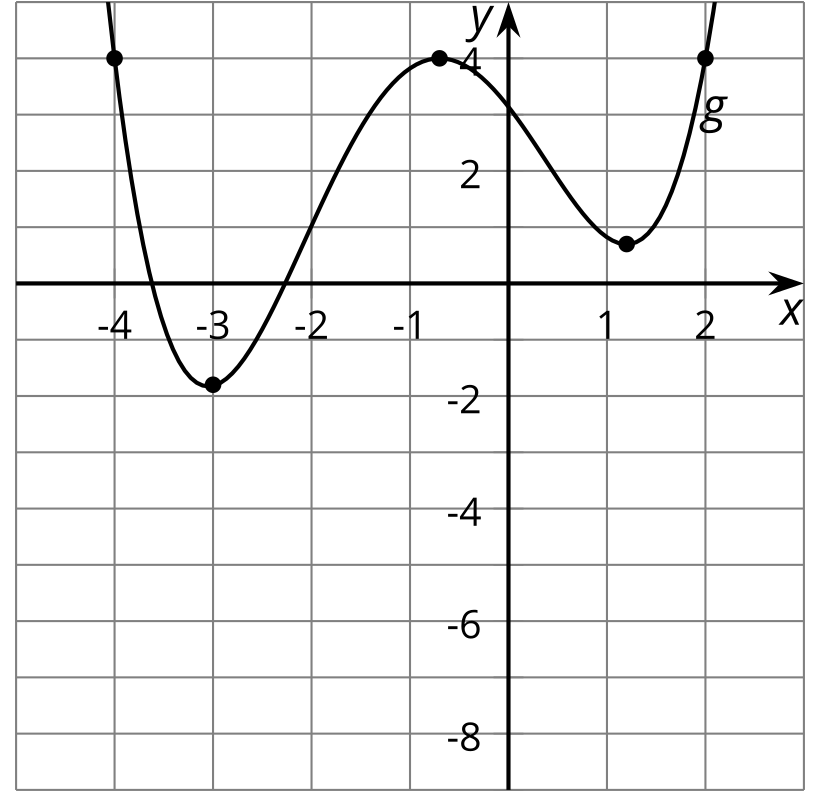
Graph each function using technology. Describe how to transform to get to the functions shown here in terms of both the graph and the equation.

### 2 Writing Equations for Vertical Translations

#### Student Task Statement

The graph of function is a vertical translation of the graph of polynomial .

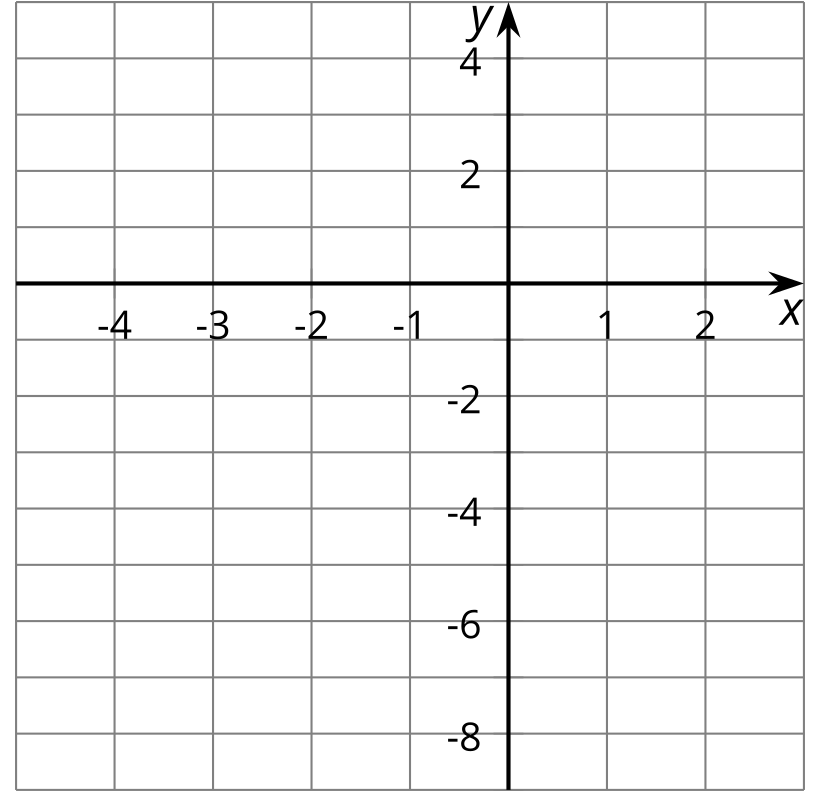




1. Complete the column of the table.
2. If , what is ? Explain how you know.
3. Write an equation for in terms of for any input .
4. The function can be written in terms of as . Complete the column of the table.

|  |  |  |  |
| --- | --- | --- | --- |
| * -4 | * 0 |  |  |
| * -3 | * -5.8 |  |  |
| * -0.7 | * 0 |  |  |
| * 1.2 | * -3.3 |  |  |
| * 2 | * 0 |  |  |

1. Sketch the graph of function .

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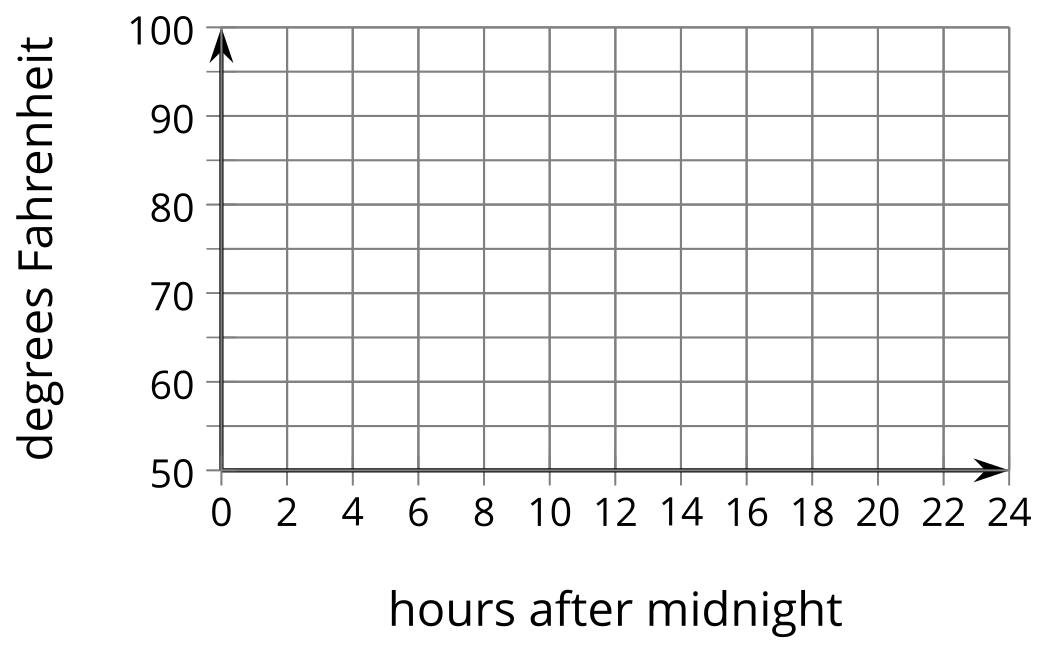
1. Write an equation for in terms of for any input .

### 3 Heating the Kitchen

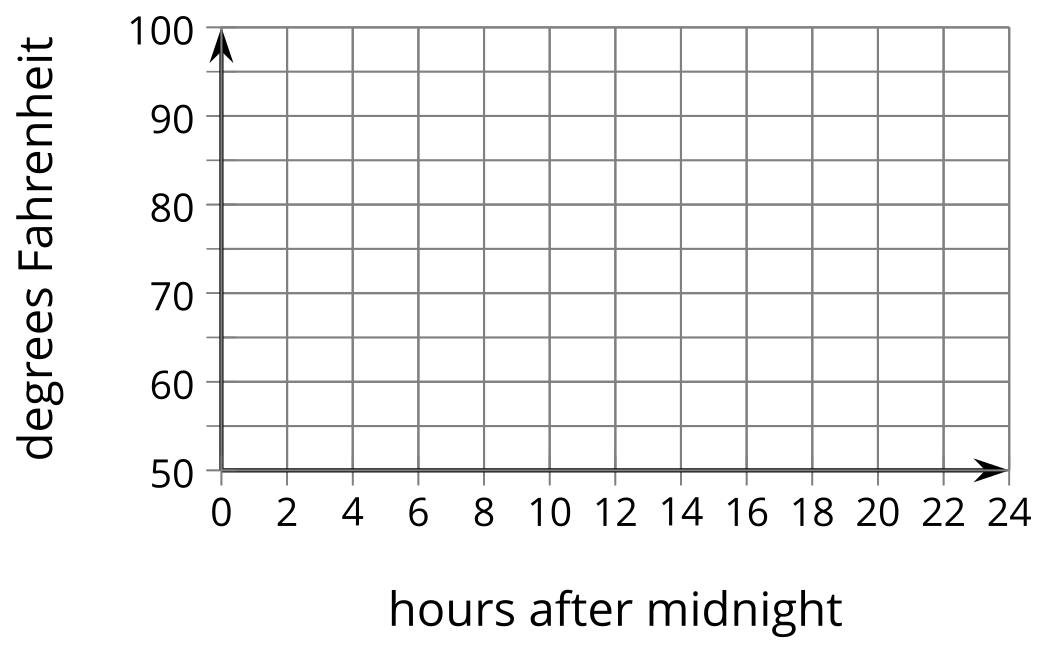
#### Student Task Statement

A bakery kitchen has a thermostat set to . Starting at 5:00 a.m., the temperature in the kitchen rises to  when the ovens and other kitchen equipment are turned on to bake the daily breads and pastries. The ovens are turned off at 10:00 a.m. when the baking finishes.

1. Sketch a graph of the function that gives the temperature in the kitchen , in degrees Fahrenheit, hours after midnight.

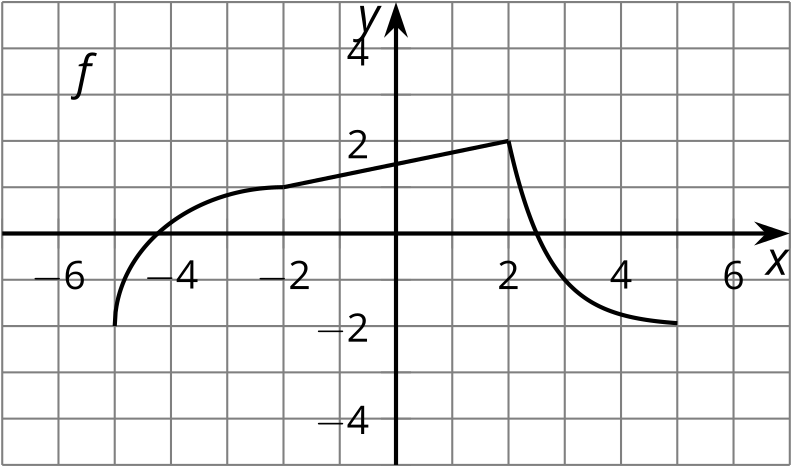
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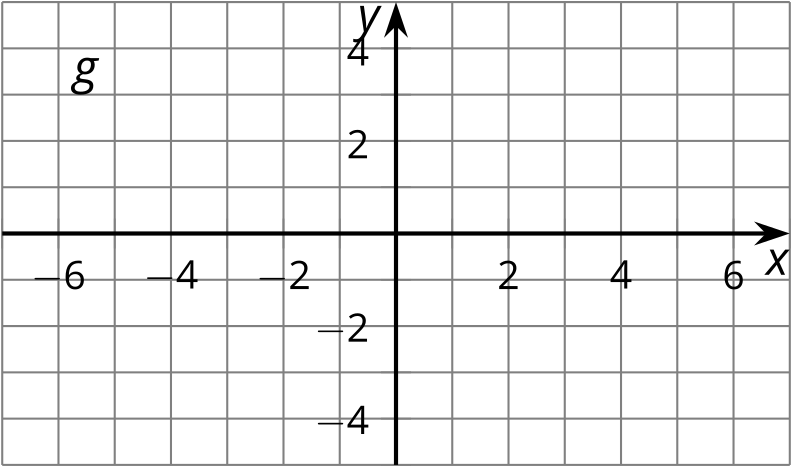
1. The bakery owner decides to change the shop hours to start and end 2 hours earlier. This means the daily baking schedule will also start and end two hours earlier. Sketch a graph of the new function , which gives the temperature in the kitchen as a function of time.

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1. Explain what means in this situation. Why is this reasonable?
2. If , then what would the corresponding point on the graph of be? Use function notation to describe the point on the graph of .
3. Write an equation for in terms of . Explain why your equation makes sense.

#### Images for Activity Synthesis







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