LEARNING INTENTION(S): What new understanding of features of functions emerge as a result of doing this task?

REVIEW:

Part I:
Aly and Dayne work at a water park and have to drain the water at the end of each month from the rides they supervise. Each uses a pump to remove the water from the small pool at the bottom of their ride. The graph below represents the amount of water in Aly’s pool, $a(x)$, and Dayne’s pool, $d(x)$, over time.

Observations for $a(x)$

Observations for $d(x)$

Observations for both $a(x)$ and $d(x)$
Part II:
Dayne figured out that the pump he uses drains water at a rate of 1000 gallons per minute and takes 24 minutes to drain.

1. Write the equation to represent the draining of Dayne’s pool, \( d(x) \). What does each part of the equation mean?

2. Based on this new information, correctly label the graph.

3. What values of \( x \) make sense in this situation? (use interval notation to write the domain of the amount of water in Dayne’s pool).

4. Determine the range, or output values, that make sense in this situation. (use interval notation to write the range of the amount of water in Dayne’s pool).

5. Write the equation used to represent the draining of Aly’s pool, \( a(x) \).

6. Using interval notation, state the domain and range for the function, \( a(x) \).

7. Compare the two domains by describing the constraints made by the two pumps.

Part III:
Use both functions to interpret the following questions.

8. When is \( a(x) = d(x) \)? What does it mean?

9. Find \( a(5) \). What does this mean?

10. If \( d(x) = 2000 \), then \( x = \_\_\_\_\_\_\_ \). What does this mean?

11. When is \( a(x) > d(x) \)? What does this mean?