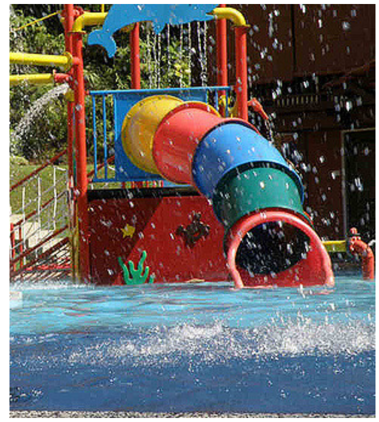
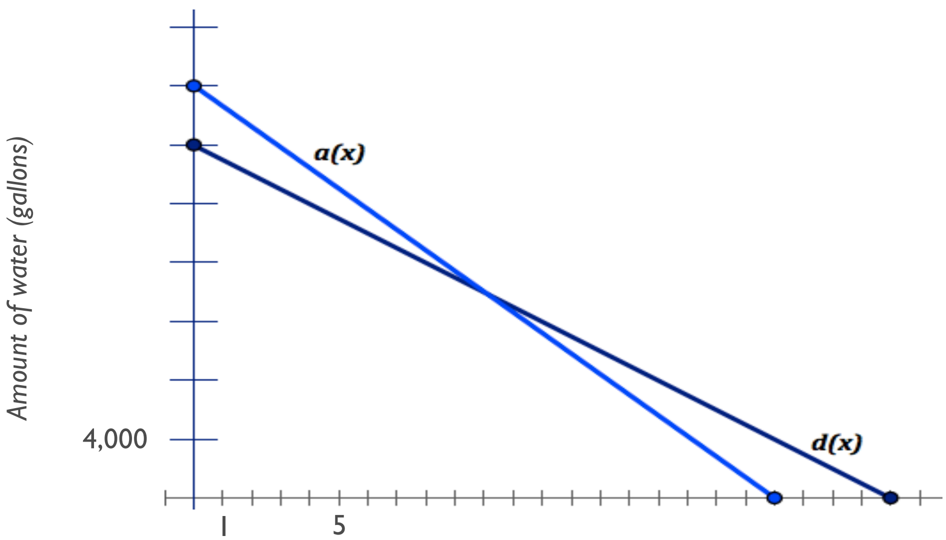
3.5 Pooling it Together

A Solidify Understanding Task



Aly and Dayne work at a water park and have to drain the water at the end of each month for the ride 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. In this scenario, they decided to work together to drain their pools and created the equation:

$$g(x) = a(x) + d(x).$$



Answer the following questions about *g(x)*.

1. What does *g(x)* represent?

2. Create the graph of *g(x)* on a new set of axes using the graphs of *a(x)* and *d(x).* Identify *g(x)* and label (scale, axes).

3. Write the equation for the function *g(x)* using the graph you created. Compare this equation to the algebraic representation of finding the sum of the equations for *a(x)* and *d(x). (*The equations were created in the last task, “The Water Park” task).

4. Should the algebraic equation of *g(x)* be the same as the algebraic function created from the graph? Why or why not?

5. Use both the graphical as well as the algebraic representation to describe characteristics of *g(x)* and explain what each characteristic means (each intercept, domain and range for this situation and for the equation, maxima and minima, whether or not *g(x)* is a function, etc.)

6. Explain why adding the two values of the y-intercepts together in *a(x) and d(x)* can be used to find the y-intercept in *g(x).*

7. Can a similar method be used to find the x-intercepts? Explain.