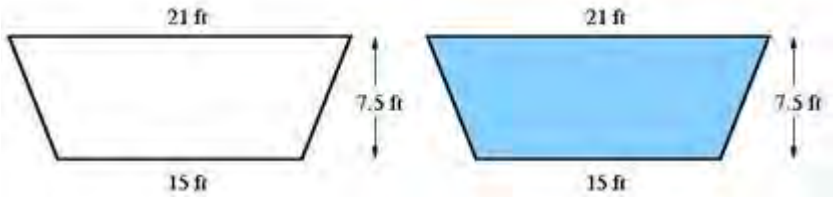
Distance across the channel

Alignment: MAFS.8.F.2.4

In science class, Mrs. Winkler's students are studying the water flow in a channel close to their school (see the photo below)

A cross section of the channel approximates the shape of an isosceles trapezoid with dimensions noted on the diagrams below: one showing an empty channel and the other the channel with water to the top of its banks.



The students found that there is a linear relationship between the *water depth* and the *distance across the channel at water level*. This means that we can write y, the distance across the channel at water level (in feet), as a function of the water depth, d (in feet).

a. Use the information in the diagram to find two depth-distance pairs (d, y) that correspond with each other. In other words, find two input-output pairs for the function.
b. Find an equation that describes y as a function of d. Draw the graph of the equation.

c. Explain the meaning of the slope and the vertical intercept of the line in the context of the situation. In other words, what does each tell you about the depth of the water and the distance across the channel at water level?
d. What is the distance across the channel at water level when the water is 2 feet deep?
e. Formulate and answer another question about this situation.
