

**Functions 2 – Graphs in Context (Shapes)**

**Homework #5**

Name \_\_\_\_\_

Per \_\_\_\_\_ Date \_\_\_\_\_

Each of the containers below is to be placed under a faucet (one at a time) that has been turned on and left to run at a constant rate. For each, on the following page draw a rough graph of the height of the water in the container versus time, where time  $t = 0$  corresponds to the time the individual container was placed under the faucet. You do not need to include units for either inputs or outputs, but try to make the shapes of your graphs as accurate as possible.

1.



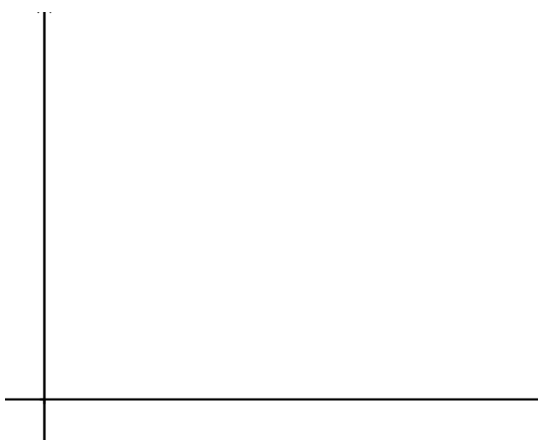
1.



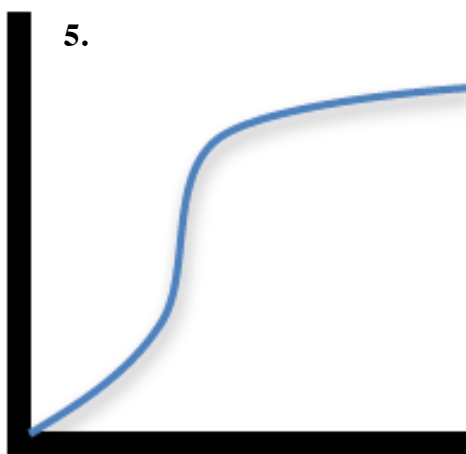
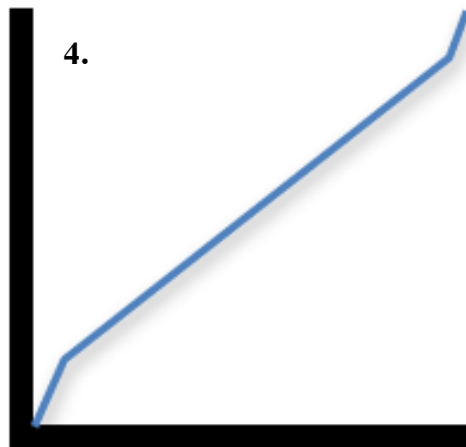
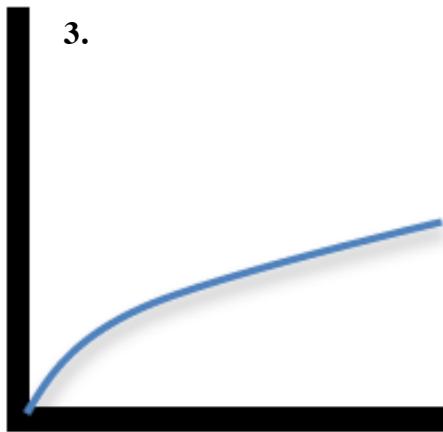
2. Assume the straw on the water bottle is part of the container and miraculously the water enters the container through the straw.



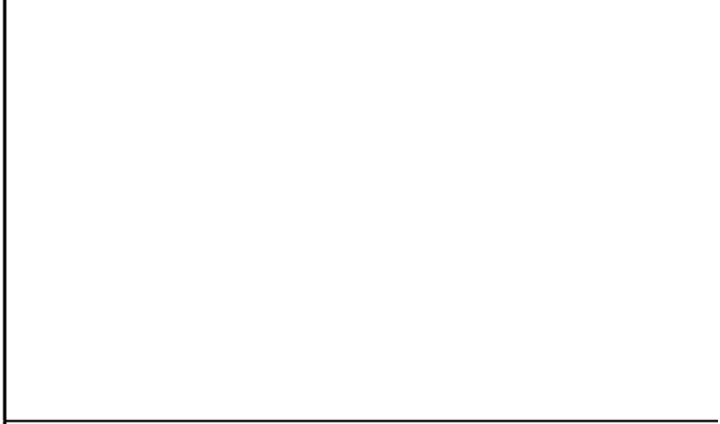
2.



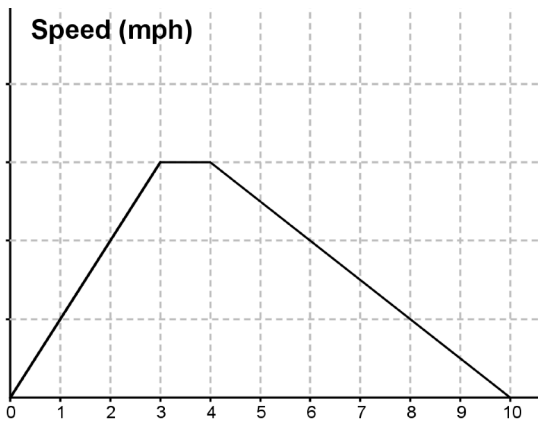
Below is depicted a number of graphs, each representing the height of water entering a container at a constant rate versus time (i.e. the horizontal axis represents time and the vertical axis represents the height of the water in the container). Next to each, create a rough drawing of a container that would yield such a graph.



6. Sammy leans out the window on the third floor of his apartment building and throws a water balloon straight up into the air and watches as it goes up and then falls back to the ground below. Relax, he first checked that no one was below. Draw a graph of the height of the balloon  $t$ -seconds after he released it. You do not need to include units for input or output, but try to make the shape as accurate as possible.

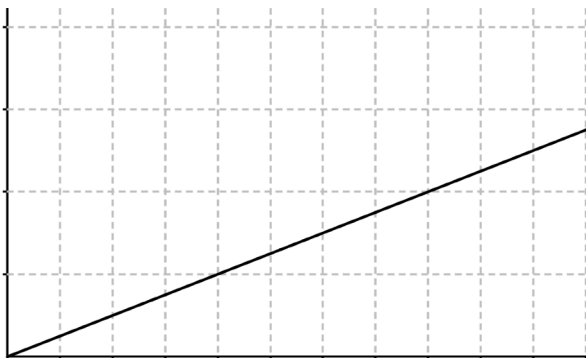


7. Below is the graph of the speed of your car as you drive to the store. What were you doing between times  $t = 3$  and  $t = 4$ ? Circle **all** possible correct answers below.



- A. Waiting for the stop light to change from red to green.
- B. Speeding up.
- C. Slowing down.
- D. Neither speeding up nor slowing down.

8. You filled up your swimming pool by turning on the water hose and waiting a long time for the pool to fill up. Below is a graph that might represent various aspects of the pool filling up. Circle **all** the possible answers for what the graph could represent.



- A. The height of the water in the pool  $t$  hours after you began filling it up.
- B. The volume of water in the pool  $t$  hours after you began filling it up.
- C. The constant rate at which the water was entering the pool (e.g. 100 gallons per hour).
- D. All of the above.