

1. The water level of a rectangular aquarium as a function of time is plotted on the following coordinate plane. When the faucet for filling the aquarium is on, the water level rises at a steady rate. Similarly, when the drain plug is pulled out, the water level falls at a steady rate (but slower than the faucet's rate). At various times some other events occur that affect the water level or the rate at which the water level changes. Identify the point in time when each of the following events **first** occurs.

- (a) Pull the plug out when the faucet is off.
- (b) Pull the plug out when the faucet is on.
- (c) Put the plug in when the faucet is on.
- (d) Dump a bucket of water into the aquarium.
- (e) Turn the faucet off when the plug is in.
- (f) Pull a large rock out of the aquarium.
- (g) Put the plug in when the faucet is off.
- (h) Turn the faucet on when the plug is in.
- (i) Turn the faucet on when the plug is out.
- (j) Turn the faucet off when the plug is out.
- (k) Find the rate at which the water depth changes when the faucet is on and the plug is in.
- (l) Find the rate at which the water depth changes when the faucet is off and the plug is out.
- (m) What is the depth of the water at the end of 3 minutes? 11 minutes? and 17 minutes?

