

Exercise 10

Explain why each function is continuous or discontinuous.

- (a) The temperature at a specific location as a function of time
- (b) The temperature at a specific time as a function of the distance due west from New York City
- (c) The altitude above sea level as a function of the distance due west from New York City
- (d) The cost of a taxi ride as a function of the distance traveled
- (e) The current in the circuit for the lights in a room as a function of time

Solution

- (a) The temperature changes gradually as time goes on, so this is a continuous function.
- (b) The temperature changes gradually as one moves away from New York City, so this is a continuous function.
- (c) The altitude above sea level as one moves away from New York City can change suddenly due to cliffs and mountains, so this is a discontinuous function.
- (d) The cost of a taxi ride increases gradually the farther you travel, so this is a continuous function.
- (e) The current in the circuit for the lights changes suddenly when a switch is flicked, so this is a discontinuous function.