Worksheet 14.1: The Partial Derivative
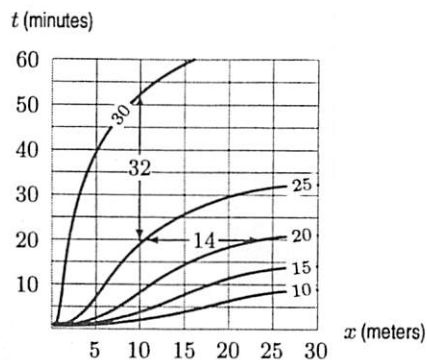
In a heated room, $H(x, t)$ gives the temperature, in °C, as a function of t, time after the heater has been turned on in minutes, and x, the distance away from the heater in meters.

1. Decribe in practical terms what $H_x(x, t)$ stands for.

2. Decribe in practical terms what $H_t(x, t)$ stands for.

3. Estimate $H_x(8, 15)$ and explain your answer in practical terms.

4. Estimate $H_t(8, 15)$ and explain your answer in practical terms.

5. Do you expect $H_x(x, t)$ and $H_t(x, t)$ to be positive everywhere, negative everywhere, or to change signs? Explain your answer.