

Name: my answers

Task Master: _____ Cynic: _____ Recorder: _____

MTH 254

THE HEATER

Spring 2015

Working in small groups (3 or 4 people), solve as many of the problems below as possible. Try to resolve questions within the group before asking for help. Each group member should then write up the solutions in their own words; Show your work! Full credit will only be given if your answer is supported by calculations and/or explanations as appropriate.

The figure below shows the contours of the temperature along one wall of a heated room through one winter day, with time indicated as on a 24-hour clock. The room has a heater located at the left-most corner of the wall, and one window in the wall. The heater is controlled by a thermostat about 2 feet from the windows.

1. Where is the window? *15 ft from the heater*

2. When is the window open? *10-11:45 16-18 hours*

3. When is the heat on? *1-2, 10-13, 16-21, and (maybe) a short interval around 25h*

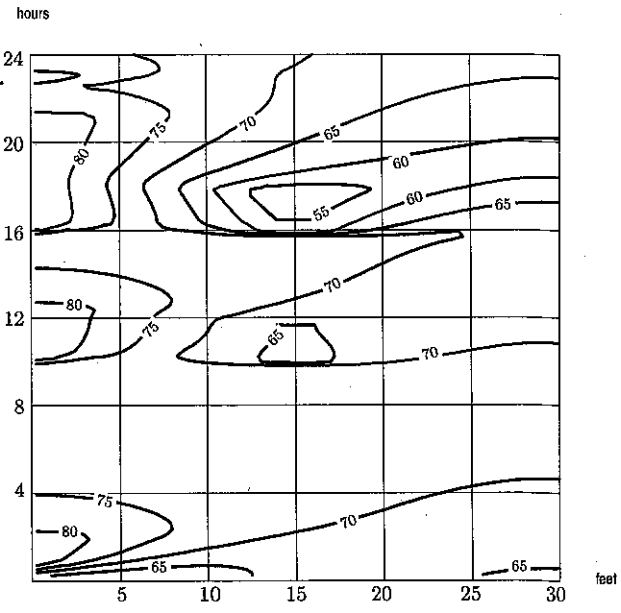
Approximately
Approximately

4. Draw graphs of the temperature along the wall of the room at 6 AM, at 11 AM, at 3 PM (15 hours), and at 5 PM (17 hours). *see below*

5. Draw a graph of the temperature as a function of time at the heater, at the window, and midway between them. *see below*

6. To what temperature do you think the thermostat is set? *≈ 70 degrees*

7. Where is the thermostat? *at 13 ft (2 ft to the left of the window)*



Briefly justify your answers (except for the graphs)!

I will also accept an answer of 17 ft (i.e. 2 ft right of the window) but your answer to 6 should then be around 65 degrees

