Name:___________________________

Problem Set 1

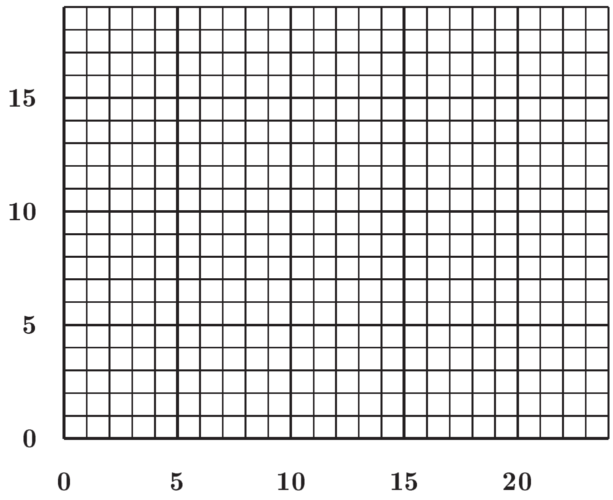
INSTRUCTIONS: Read all the problems carefully and show all your work.

PROBLEM 1 ***Temperature readings T (in degrees Celsius) were recorded every hour starting at midnight on a day in May in Louisville, Kentucky, as in the following table. The time x is measured in hours from midnight. Find the average rate of change of temperature with respect to time for the following: (a) from noon to 3 PM. (b) from noon to 2 PM.***

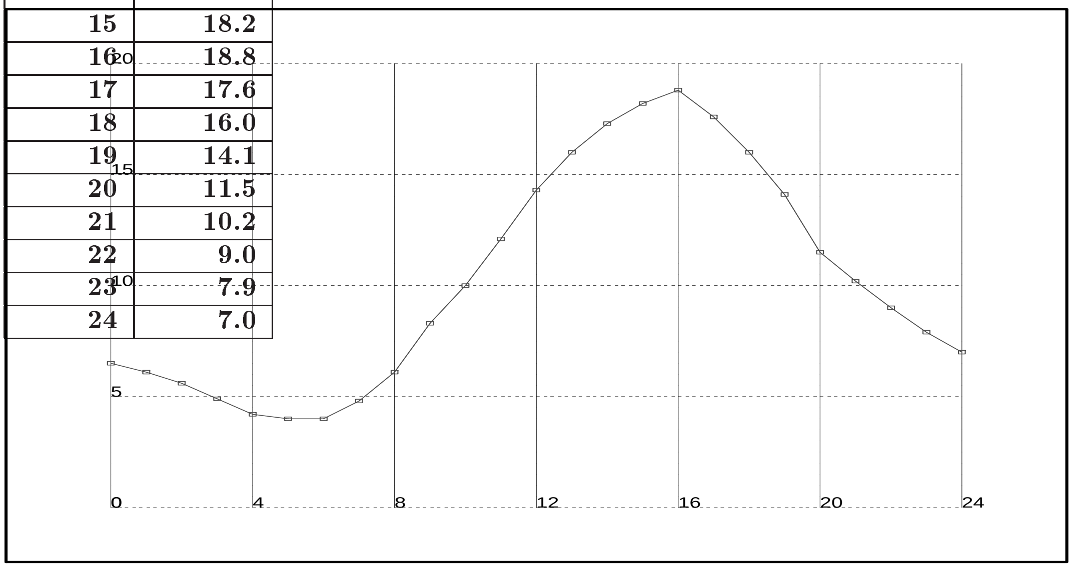
Solution: (a) From noon to 3 PM the temperature changes from 14.3 to 18.2.
So $\frac{\Delta T}{\Delta x} = T(15) - T(12) = 18.2 - 14.3 = 3.9$
$\frac{T}{x} = \frac{3.9}{15-12} =$ **1.3**
Solution: (b) From noon to 2 PM the average rate of change is $\frac{T}{x} = \frac{T(14)-T(12)}{14-12} = \frac{17.3-14.3}{2} =$ **1.5**

PROBLEM 2 ***Plot the data on the graph paper given below and draw a plausible temperature function based on the information in the table.***

Time x (hours)	Temp T (C°)
0	6.5
1	6.1
2	5.6
3	4.9
4	4.2
5	4.0
6	4.0
7	4.8
8	6.1
9	8.3
10	10.0
11	12.1
12	14.3
13	16.0
14	17.3
15	18.2
16	18.8
17	17.6
18	16.0
19	14.1
20	11.5
21	10.2
22	9.0
23	7.9
24	7.0



See what happens here.



PROBLEM 3 *Use the table to estimate the instantaneous rate of change at noon?*