

Support skills for Preview 16 Part C

In the next Preview Assignment and in the next class you will need to calculate and interpret unit rates from a table of data and calculate slope from two data points in a linear relationship.

Slope and Linear Functions

- 1) At 8am, the weather app on your phone showed that the temperature outside was 74°F . Upon arrival at work, one of your co-workers said that a cold front was expected later in the day. Out of curiosity, you checked the temperature several times during the day: At 10am the temperature was 60°F , and at 1pm the temperature was 39°F .



Credit: OlgaVolodina/iStock/Thinkstock

The table below shows the data for times and the corresponding temperatures.

Hours after 8am	0	2	
Temperature in $^{\circ}\text{F}$	74	60	

Part A: Write an explanation for why the table starts with zero in the time row, instead of 8.

Part B: Write an explanation for why the second entry in the table has 2 for hours, instead of 10am.

Part C: Complete the last entry in the table based on the last temperature check in the problem description.

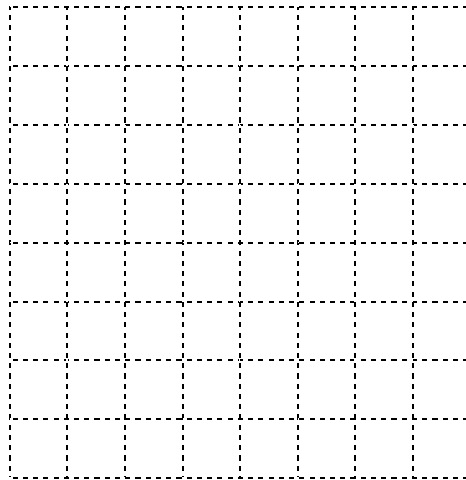
- 2) Notice that unlike the tables in Worksheets 16A and 16B, the table does not explicitly show the slope, or the temperature decrease per hour, because the hours are not consecutive. However, we can still find the rate of change.

Part A: Write the temperature decrease during the first two hours as a rate.

Part B: Write the rate from Part A as a unit rate, which is also the slope.

Part C: Now use the temperatures at hour 2 and hour 5 to calculate the rate of change.
Show your work.

Part D: Graph the data in the table, labeling your axes.



3) Now that we know the rate of change, we can use it to determine some additional data points (assuming that the temperature was falling at the same rate all day).

Part A: Determine the temperature outside at 9am. Show your work.

Part B: Determine the temperature 3 and 4 hours after 8am. Show your work.

Part C: At what temperature does water freeze? Look up this value, if necessary.

Part D: If the temperature continues dropping at the same rate, when would the temperature reach freezing? Show your work.

- 4) For this situation, we assumed that the temperature was dropping at a constant rate, so it had a constant rate of change.

Part A: Consider the leaking pipe situation from Worksheet 16A. Did we assume that it had a constant rate of change?

Part B: Consider the receding water situation from Worksheet 16B. Did we assume that it had a constant rate of change?

Part C: Compare the graphs for all three scenarios. How are they similar? How are they different?

Straight lines occur in scenarios that have a constant slope or a constant rate of change. Due to this fact, graphs and situations with constant rates of change are called **linear patterns**, or **linear functions**.

