Unit 4 Lesson 7: Using Graphs to Find Average Rate of Change

1 Temperature Drop (Warm up)

Student Task Statement

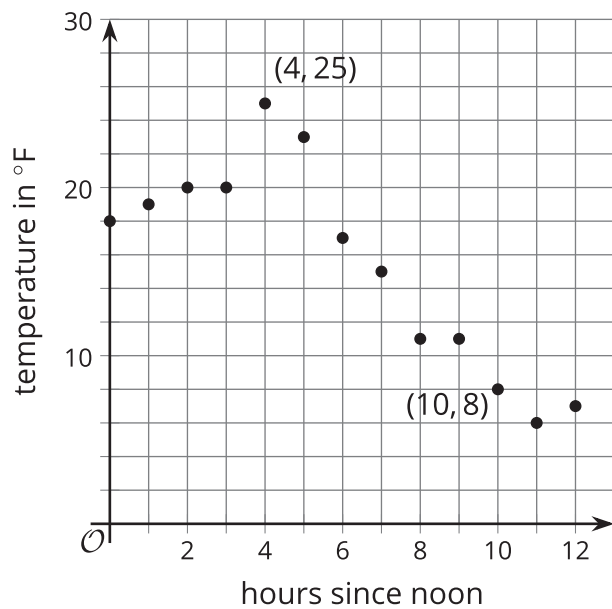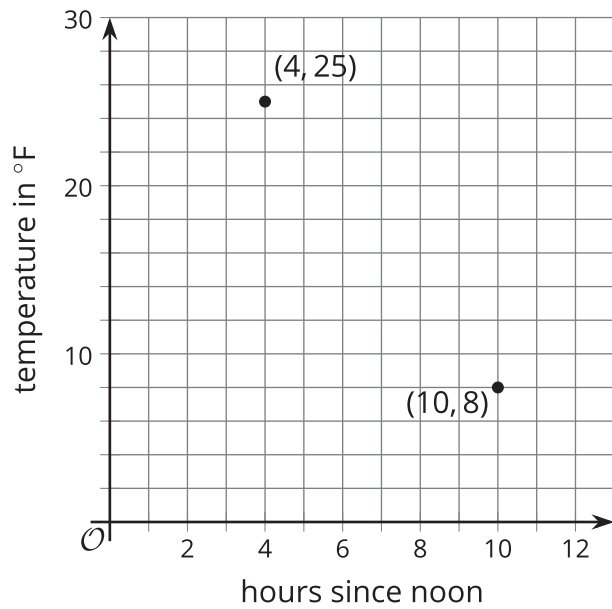Here are the recorded temperatures at three different times on a winter evening.

time	4 p.m.	6 p.m.	10 p.m.
temperature	$25°F$	$17°F$	$8°F$

- Tyler says the temperature dropped faster between 4 p.m. and 6 p.m.

- Mai says the temperature dropped faster between 6 p.m. and 10 p.m.

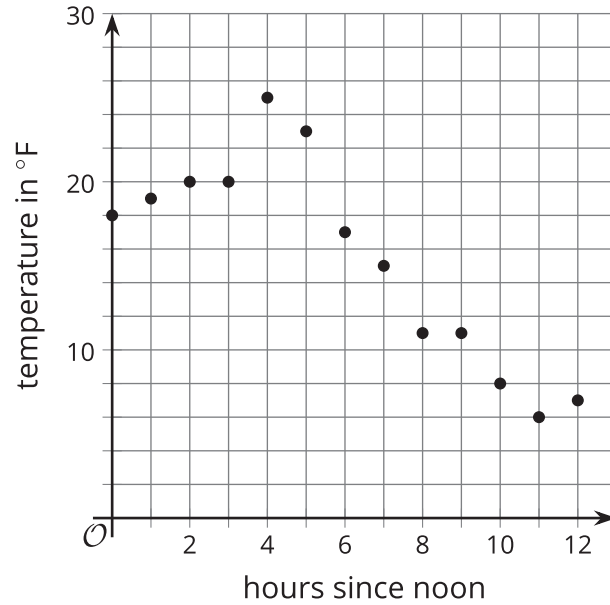Who do you agree with? Explain your reasoning.

2 Drop Some More

**Images for Launch**

Student Task Statement

The table and graph show a more complete picture of the temperature changes on the same winter day. The function T gives the temperature in degrees Fahrenheit, h hours since noon.

h	$T(h)$
0	18
1	19
2	20
3	20
4	25
5	23
6	17
7	15
8	11
9	11
10	8
11	6
12	7

1. Find the **average rate of change** for the following intervals. Explain or show your reasoning.

   a. between noon and 1 p.m.

   b. between noon and 4 p.m.

   c. between noon and midnight

2. Remember Mai and Tyler's disagreement? Use average rate of change to show which time period—4 p.m. to 6 p.m. or 6 p.m. to 10 p.m.—experienced a faster temperature drop.
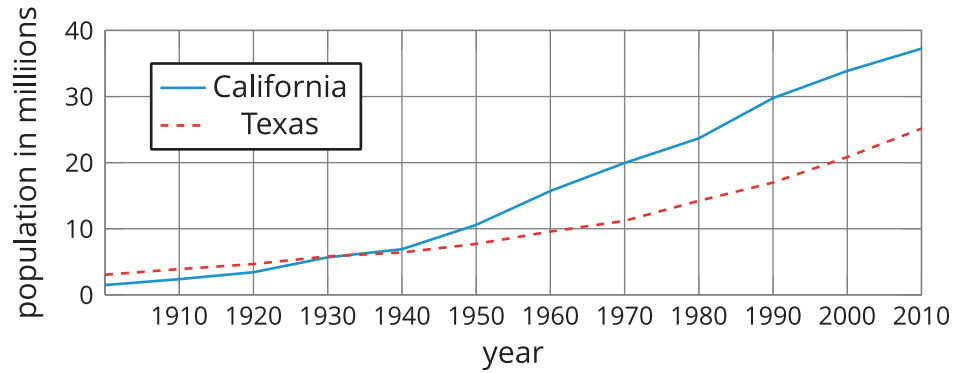
Activity Synthesis
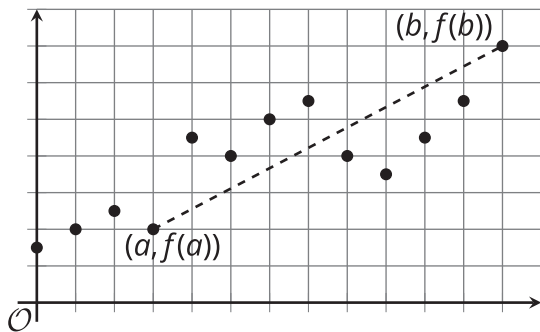
3 Populations of Two States

Student Task Statement

The graphs show the populations of California and Texas over time.

1. a. Estimate the average rate of change in the population in each state between 1970 and 2010. Show your reasoning.

   b. In this situation, what does each rate of change mean?

2. Which state's population grew more quickly between 1900 and 2000? Show your reasoning.