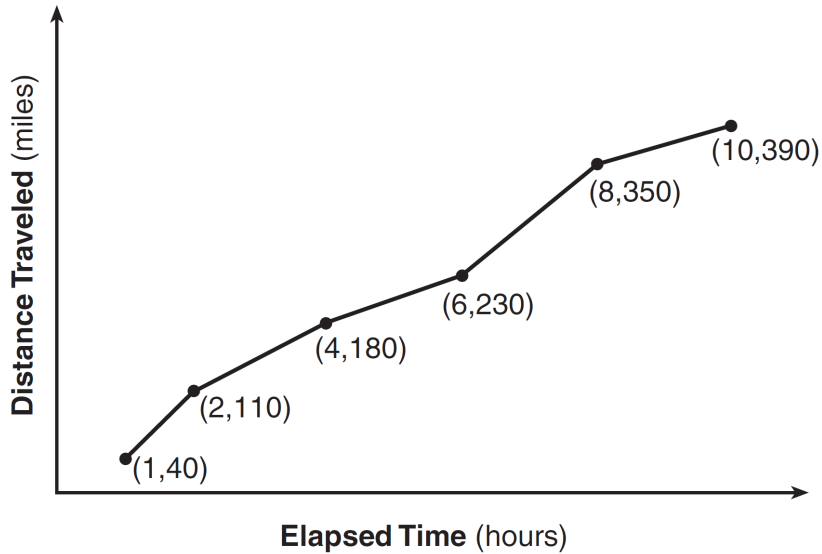


Problem set: Rate of change

Show the formula for rate of change with the substituted values for full credit. State your result with units.

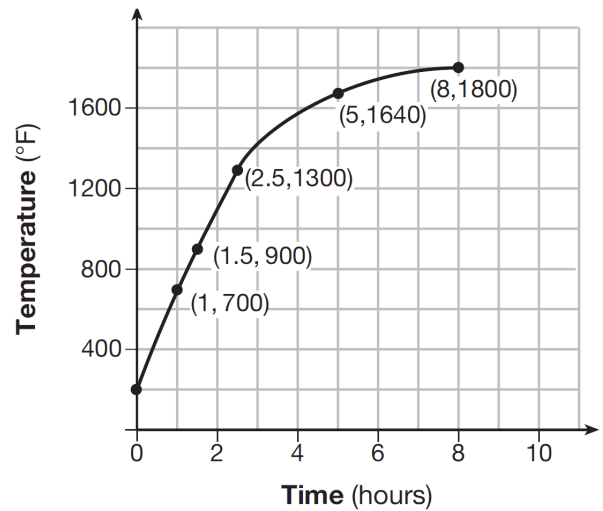
1. The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.



- a) How many miles did they travel between the 6th hour and the 8th hour?
- b) What was their average speed over the period from the 6th hour to the 8th hour?
- c) What was average speed over the interval from the 2nd hour to the 8th hour?

2. Firing a piece of pottery in a kiln takes place at different temperatures for different amounts of time. The graph shows the temperatures in a kiln while firing a piece of pottery after the kiln is preheated to 200°F .

a) How many degrees did the temperature increase in the interval from 1.0 hours to 2.5 hours?



b) What was the average rate of change in temperature per hour during the interval from 2.5 hours to 5 hours?

2. Let f be a function such that $f(x) = 2x - 4$ is defined on the domain $2 \leq x \leq 6$. What is the range of this function?

3. The table below shows the average diameter of a pupil in a person's eye as he or she grows older.

Age (years)	Average Pupil Diameter (mm)
20	4.7
30	4.3
40	3.9
50	3.5
60	3.1
70	2.7
80	2.3

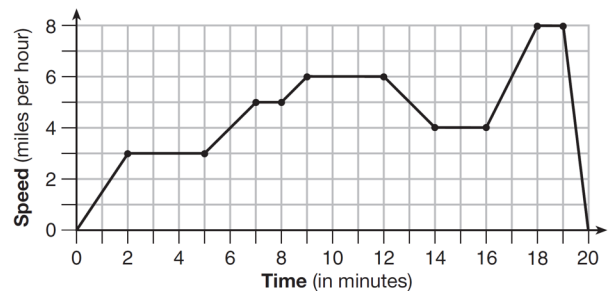
What is the average rate of change, in millimeters per year, of a person's pupil diameter from age 20 to age 80?

4. The function $h(t) = -16t^2 + 144$ represents the height, $h(t)$, in feet, of an object from the ground at t seconds after it is dropped.

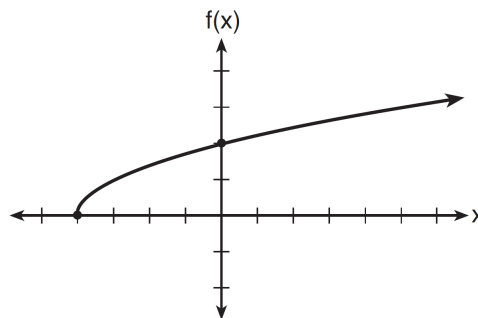
a) What is the height after one second?

b) How much time has elapsed when the ball hits the ground?

5. The graph represents a jogger's speed during her 20-minute jog around her neighborhood. Describe what the jogger was doing during the 9–12 minute interval of her jog?



6. The graph of the function $f(x) = \sqrt{x+4}$ is shown below. What is the domain of the function?



7. Joey enlarged a 3-inch by 5-inch photograph on a copy machine. He enlarged it four times. The table below shows the area of the photograph after each enlargement.

Enlargement	0	1	2	3	4
Area (square inches)	15	18.8	23.4	29.3	36.6

What is the average rate of change of the area from the original photograph to the fourth enlargement, to the *nearest tenth*?

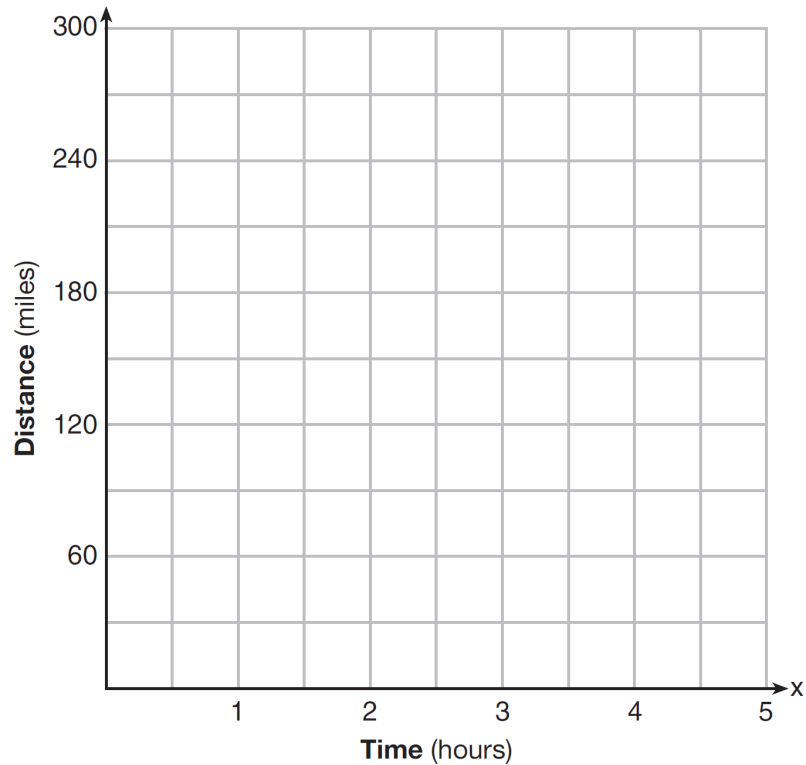
8. An astronaut drops a rock off the edge of a cliff on the Moon. The distance, $d(t)$, in meters, the rock travels after t seconds can be modeled by the function $d(t) = 0.8t^2$

a) What distance has it traveled after 5 seconds?

b) How far has it traveled after 10 seconds?

c) What is the average speed, in meters per second, of the rock between 5 and 10 seconds after it was dropped?

11. A driver leaves home for a business trip and drives at a constant speed of 60 miles per hour for 2 hours. Her car gets a flat tire, and she spends 30 minutes changing the tire. She resumes driving and drives at 30 miles per hour for the remaining one hour until she reaches her destination. On the set of axes below, draw a graph that models the driver's distance from home.



a) How far did she travel from home to her destination?

b) How long did it take, including the stop?

c) What is her average speed over the entire trip, including when she was stopped?