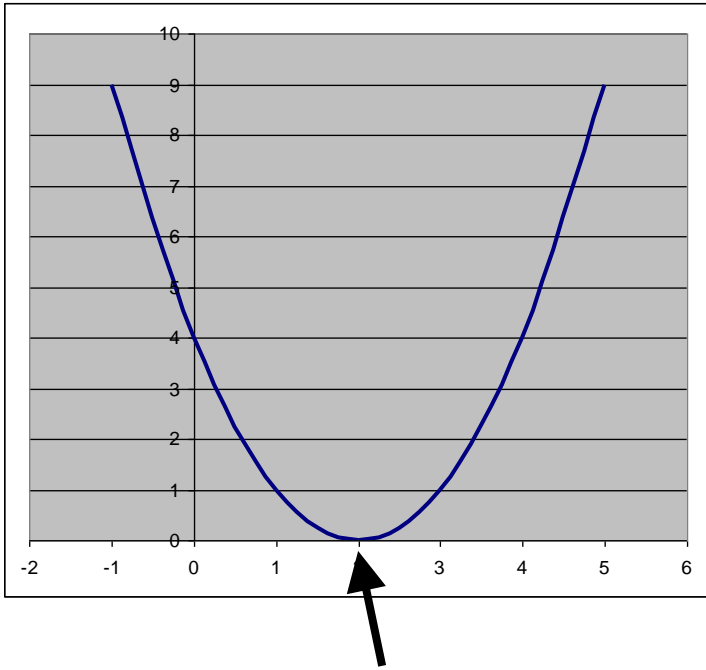


Math-1010

Lesson 1-3

(Textbook Activities 1.5 and 1.6)

Vocabulary

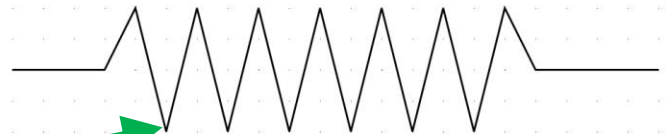


Local minimum value: is the **y-value** of the minimum point. ($y = 0$ for this graph).

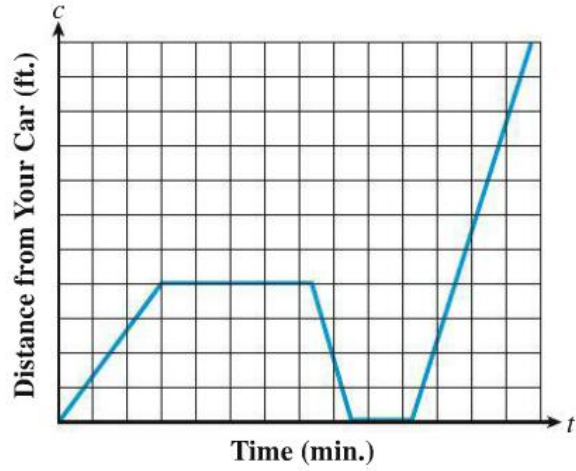
You can think of minimum point as the bottom of a “valley.”

Minimum Point: the point where a graph changes from decreasing to increasing.

The minimum point may be a “sharp” point on the graph:

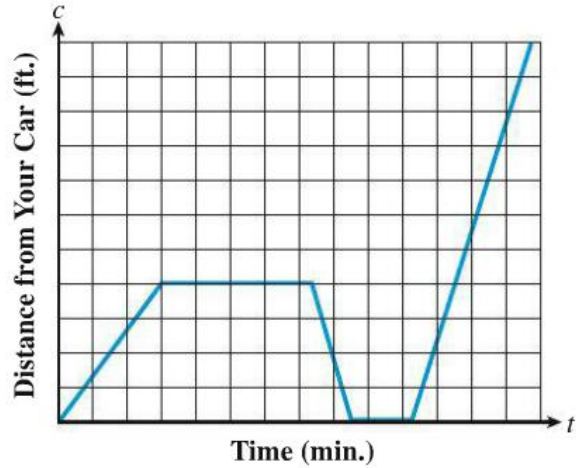


Graph of your walk from the parking lot to the library.



List everything you can determine from the graph

Graph of your walk from the parking lot to the library.



List everything you can determine from the graph

Practical domain is $t = [0 \text{ min}, \sim 13.6 \text{ min}]$

Function? Yes because at any given time you can only be at one place, therefore only at a single distance from your car.

After ____ min. of walking, you stopped for \sim ____ min.

For the first 3 min. your speed was ____?

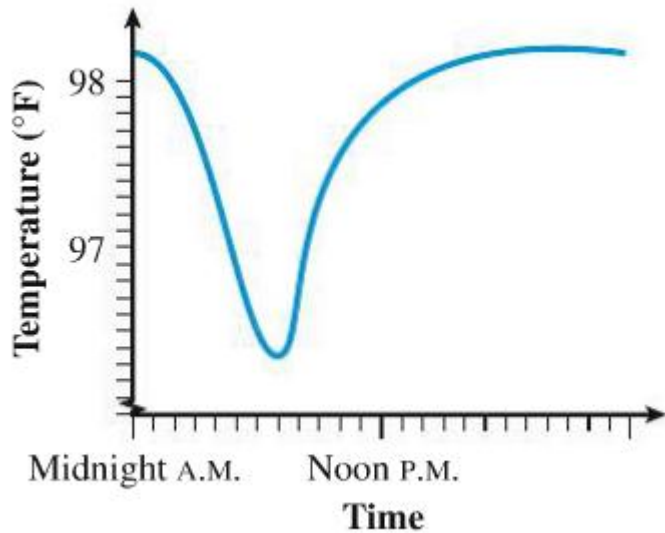
It took you ____ min. to return to your car after you stopped.

Your speed was ____ on your return trip.

You stayed at your car ____ min.

It took you ____ min. to walk to the library on your 2nd attempt.

A Graph of a person's core body temperature



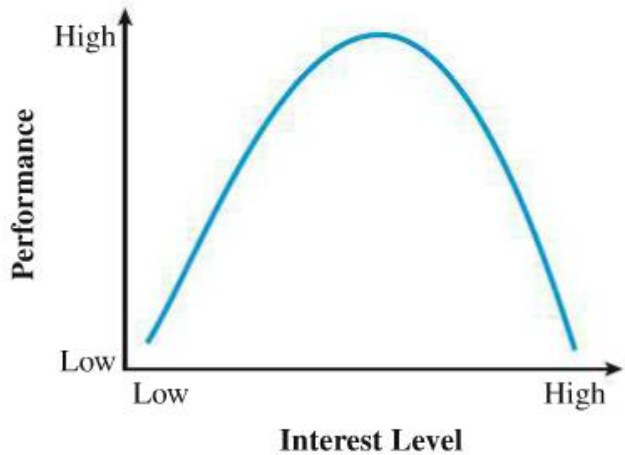
1) Describe in words what the graph is telling you.

2) _____ = f(_____)

3) Independent variable: _____

4) Dependent variable: _____

Performance of a simple task.



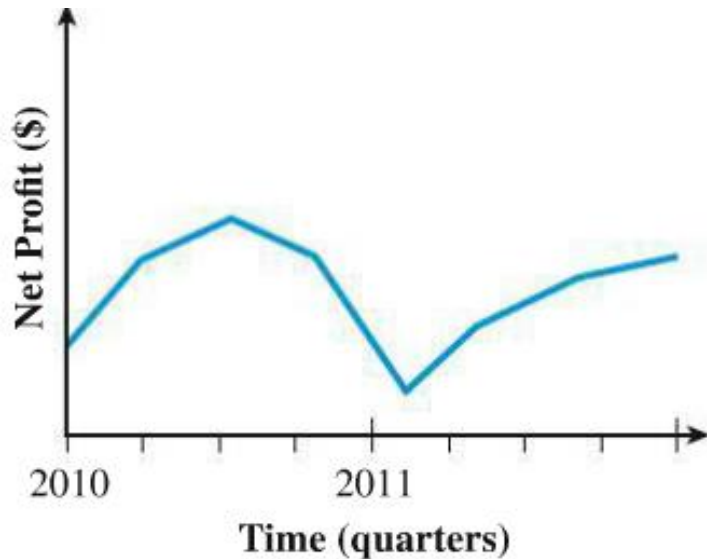
1) Describe in words what the graph is telling you.

2) _____ = f(_____)

3) Independent variable: _____

4) Dependent variable: _____

Net profit of a business by business quarter



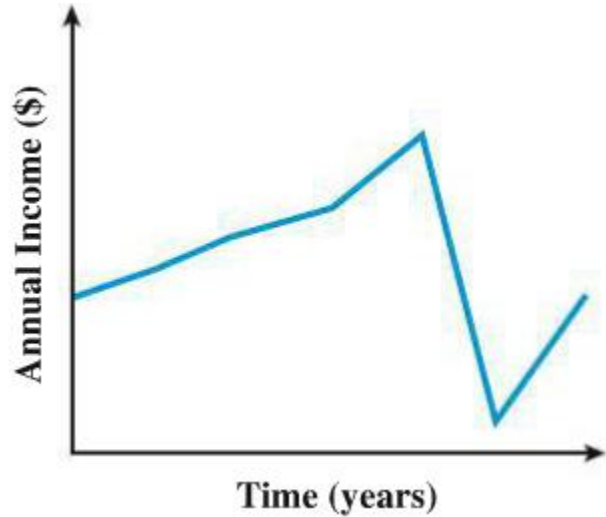
1) Describe in words what the graph is telling you.

2) _____ = f(_____)

3) Independent variable: _____

4) Dependent variable: _____

Annual gross income



1) Describe in words what the graph is telling you.

2) _____ = f(_____)

3) Independent variable: _____

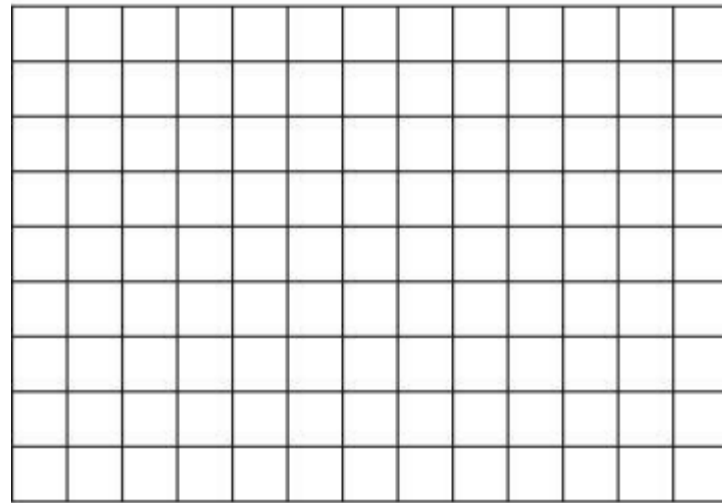
4) Dependent variable: _____

You leave home on Friday afternoon for your weekend getaway. Heavy traffic slows you down for the first half of your trip but you make good time for the last half.

1) Express your distance from home as a function of time.

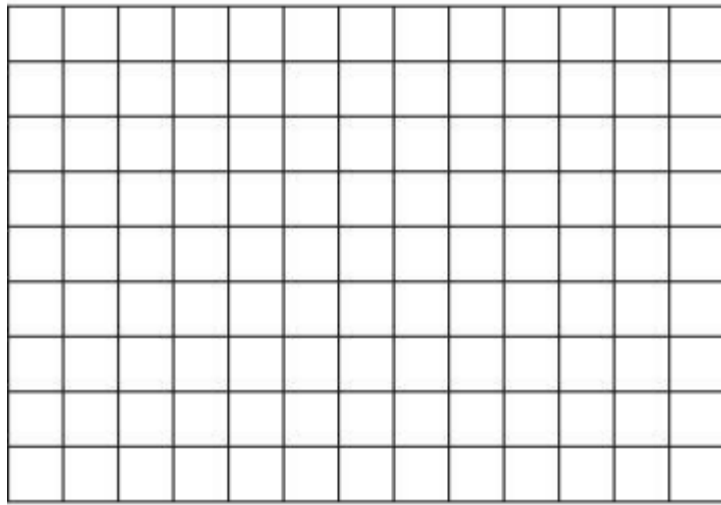
a) Using function notation

b) Graphically.



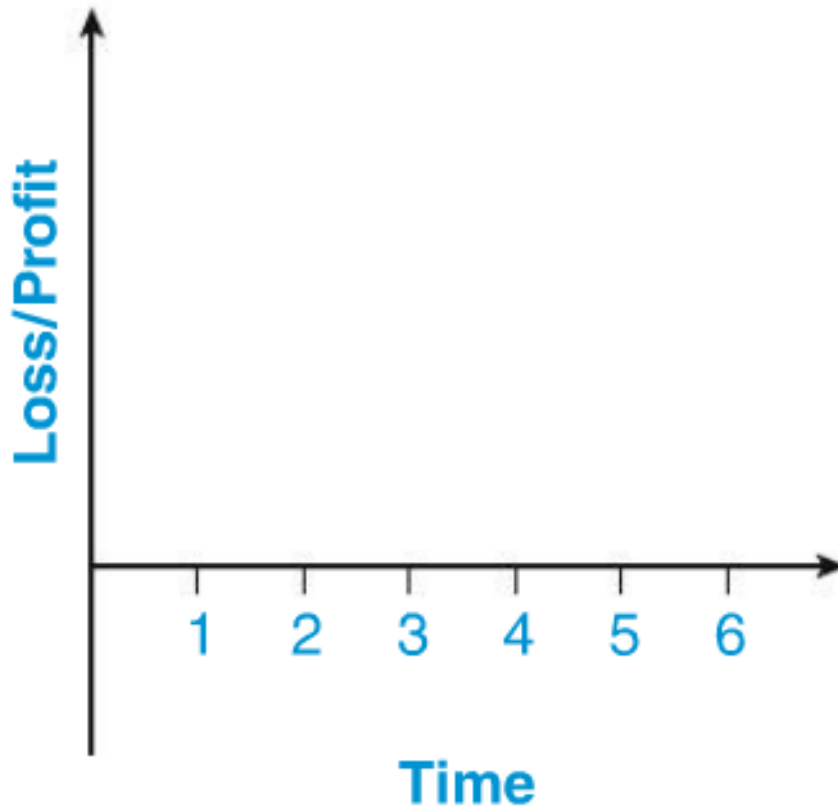
Your new job pays \$6 per hour, with a raise of \$2 per hour every 6 months. After one and a half years, you receive a promotion that gives you a wage increase of \$5 per hour, but your next raise won't come for another year after that.

1) Sketch a graph of your wage over your first 2 ½ years.



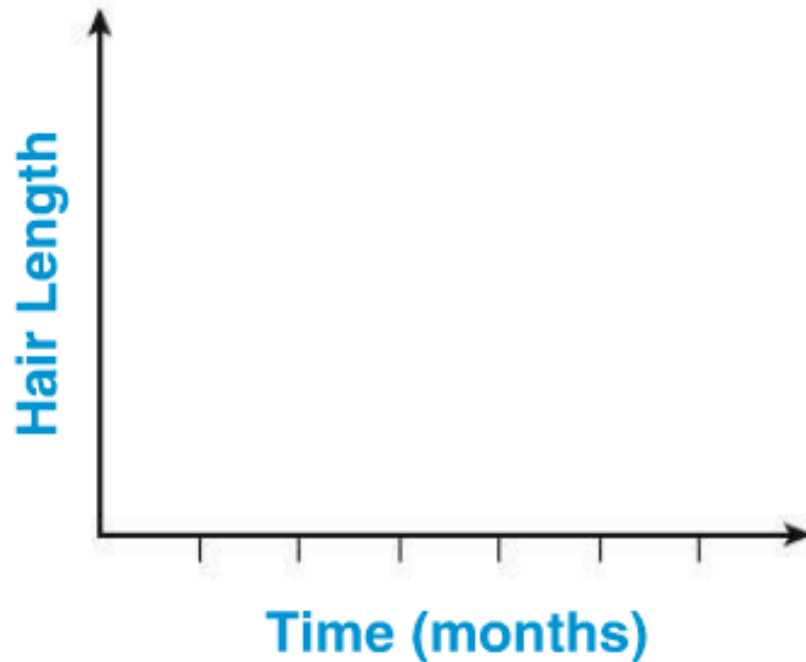
Your small business started slowly, losing money in its first 2 years, then breaking even in year 3. By the fourth year, you made as much as you lost in the first year and then doubled your profits each of the next two years.

1) Graph your profit as a function of time.



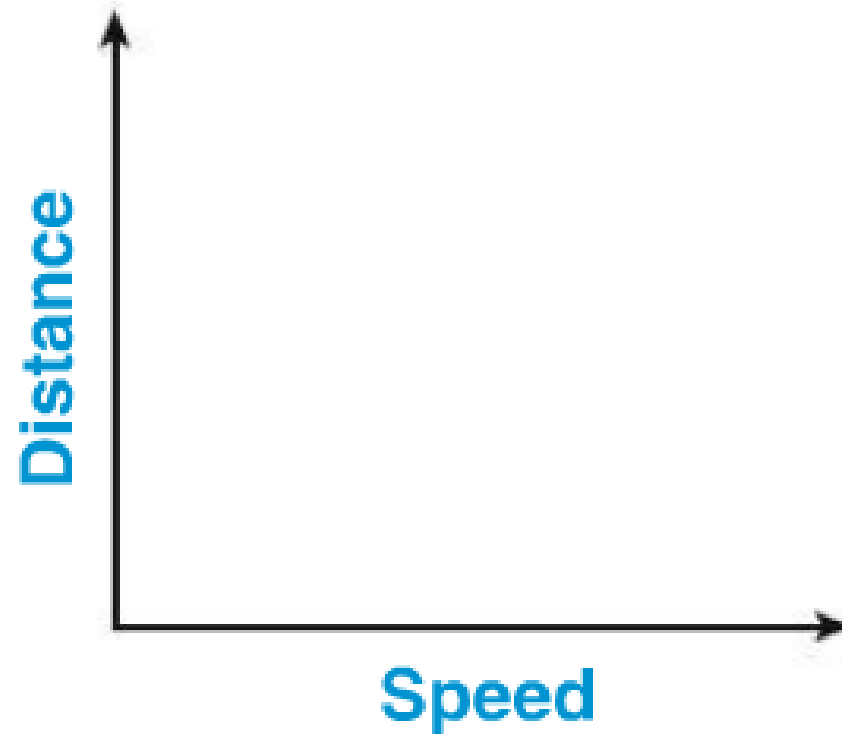
Hair grows at a steady rate. Suppose you get your hair cut every month. Measure the longest hair on your head.

1) Graph your hair length over the course of 6 months.



The distance traveled is a function of speed in a fixed time interval.

1) Draw a graph that represents this concept.



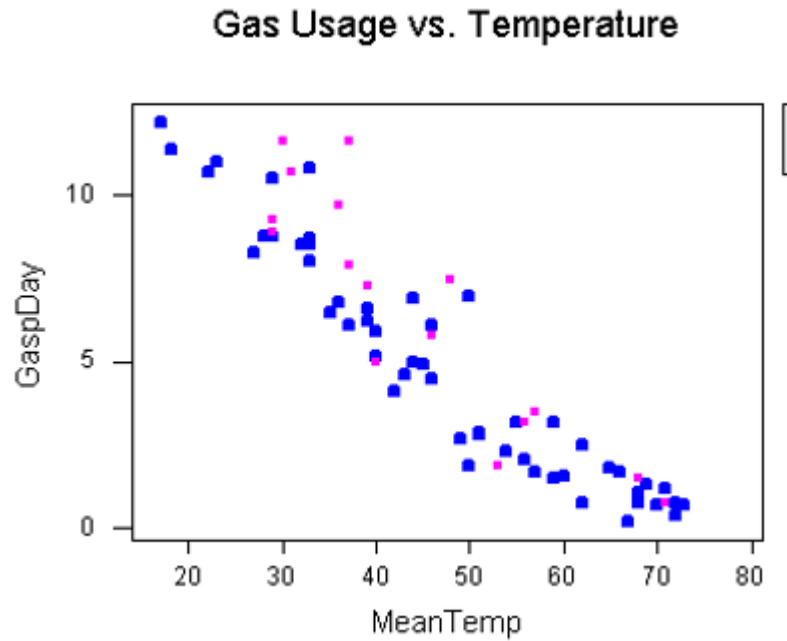
Suppose you are a member of a health and fitness club. Your personal trainer has developed a special diet and exercise program for you. At the beginning of the program and once a week thereafter, you are tested on the treadmill. The test consists of how many minutes it takes you to walk, jog, or run 3 miles on the treadmill. The following data gives your treadmill time, 't', over an 8-week period.

End of Week, w	0	1	2	3	4	5	6	7	8
Time, t (min.)	45	42	40	39	38	38	37	39	36

Is time ('t') a function of weeks? If so, what is the input variable? The output variable?

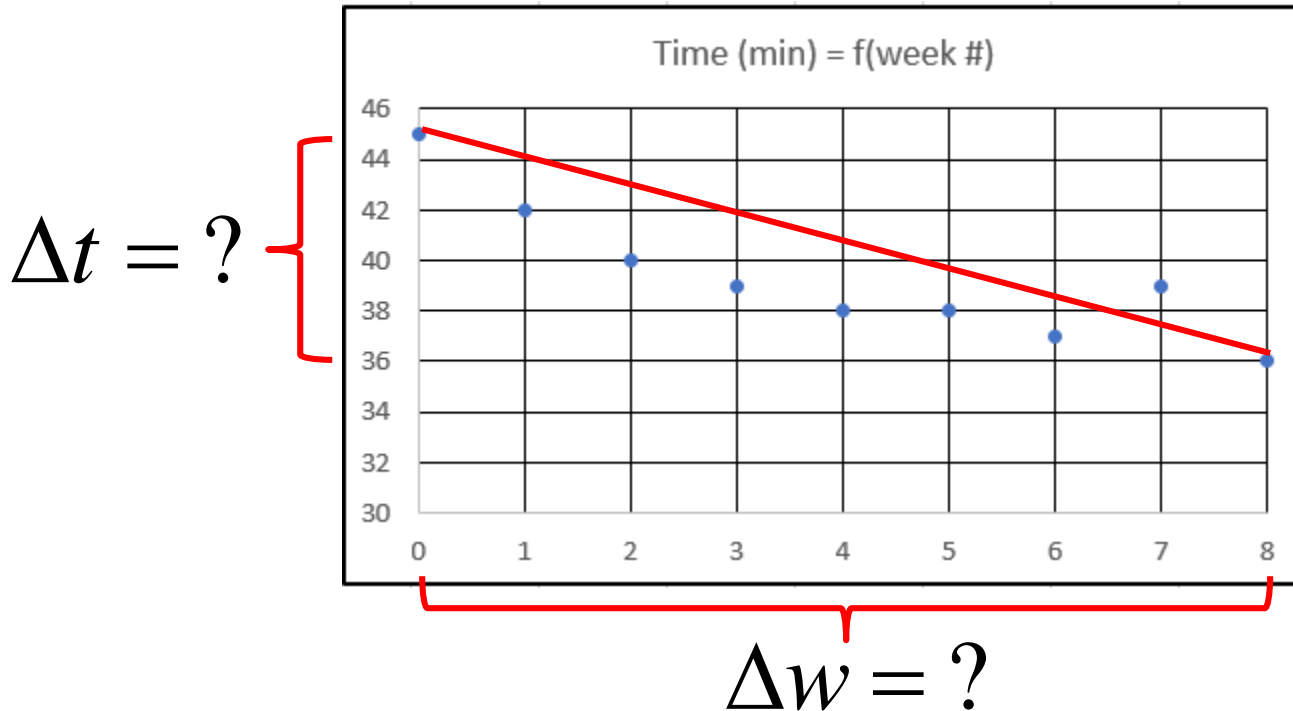
Graph the relation.

Scatter Plot: a graph of discrete data points.



Why do they call this a “scatter plot”?

Your parents are paying “big bucks” for your health club membership. How can you prove to them it is worth their money from your scatter plot of treadmill times?



What is the total change of your treadmill times? $\Delta t = ?$

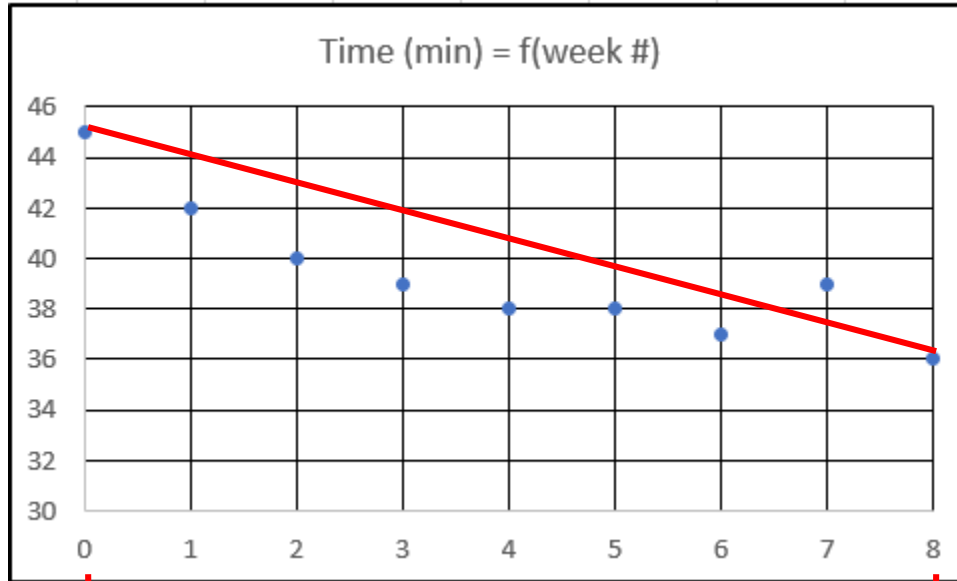
What is the total change of number of weeks? $\Delta w = ?$

Average Rate of change: (slope) $m = \frac{\Delta t}{\Delta w}$

What is the significance of the sign (+/-) of the average rate of change?

$$m = \frac{\Delta t}{\Delta w}$$

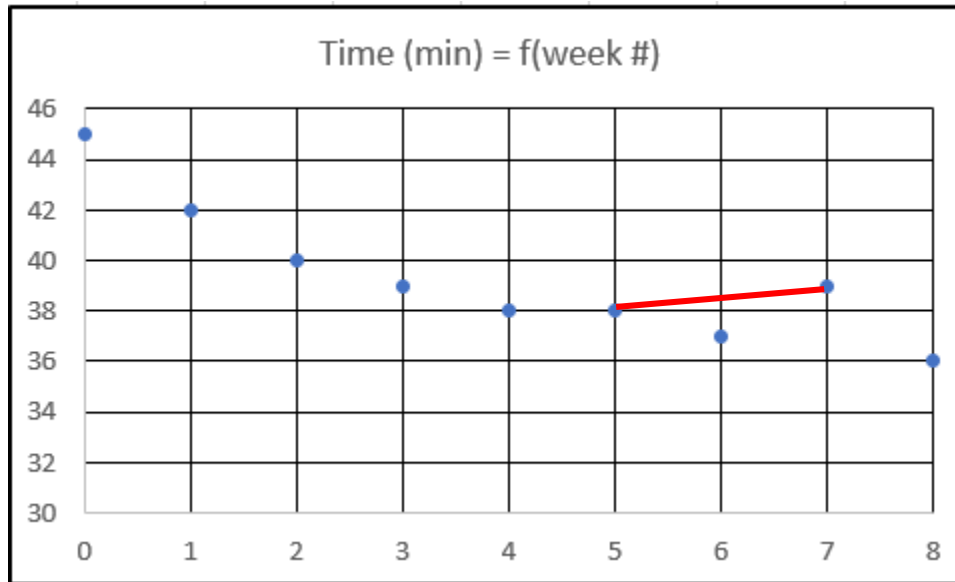
$\Delta t = ?$



$\Delta w = ?$

Calculate the average rate of change between weeks 5 and 7.

$$m = \frac{\Delta t}{\Delta w}$$



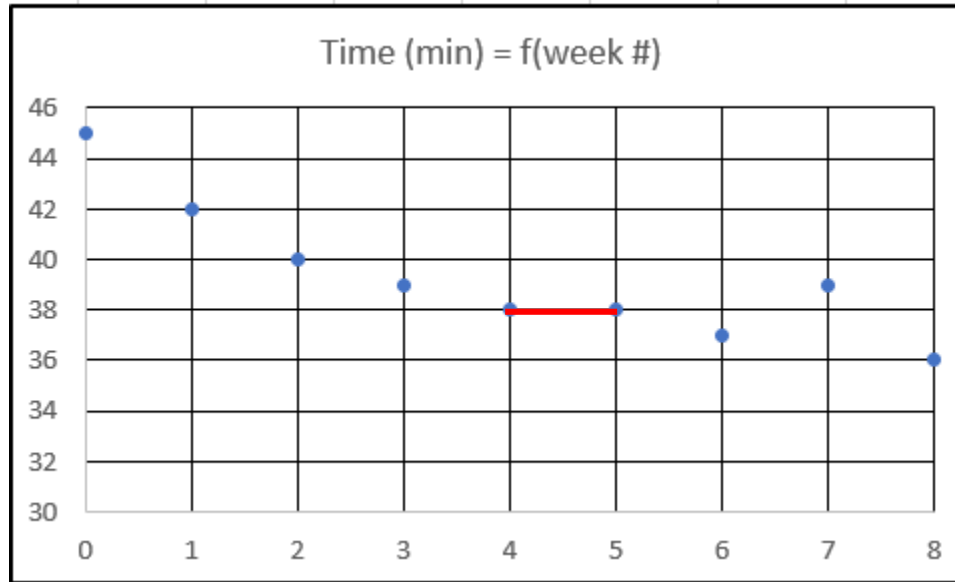
What is the significance of the sign (+/-) of the average rate of change for this exercise period?

Connect data points (5, 38) and (7, 39) with a line segment.

Is the rate of change positive or negative?

Calculate the average rate of change between weeks 4 and 5.

$$m = \frac{\Delta t}{\Delta w}$$



Is the rate of change positive or negative?

Connect data points $(4, f(4))$ and $(5, f(5))$ with a line segment.

What is the significance of the average rate of change for this exercise period?

During the first 5 weeks of your exercise program you record your weight.

End of Week, w	0	1	2	3	4	5
weight, y (lb.)	196	183	180	177	174	171

Determine the average rate of change of your weight during the first 3 weeks.

Determine the average rate of change of your weight during the 5-week period.

What are the units of measure of the average rate of change of your weight?

What is the practical meaning of the average rate of change for this situation?