

AFM Objective 2.02

Piecewise-defined Functions

Solve the following problems on a SEPARATE sheet of paper. Number each problem and part. Be neat and organized. If asked to graph, you must use graph paper. Attach graph to paper neatly with tape or a glue stick in correct part of problem.

This will count as a quiz grade and is due no later than Tuesday, Sept. 20 at beginning of 3rd period.

Problem 1: Given the following piecewise function $h(x) = \begin{cases} x^2, & -3 \leq x < 3 \\ 2 - x, & 3 \leq x < 7 \end{cases}$

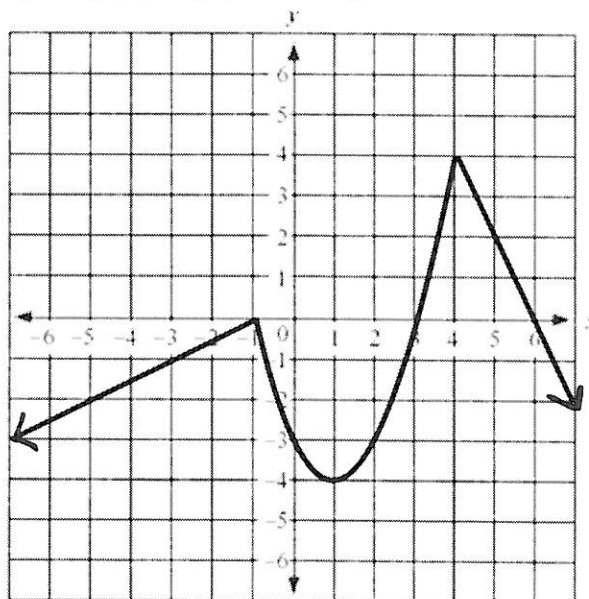
- Sketch the graph and state the domain and range using interval notation.
- What is $h(3)$? How do you know which function to use?

Problem 2: A fast-moving cold front in the Northeast can cause temperatures to drop very quickly then rise again. The following data uses t as the hours since midnight on a day the cold front moves in, and T as the temperature in degrees Fahrenheit.

t (hr)	0	1	2	3	4	5	6	7	8	9	10
T (°F)	3	1	-1	-3	-5	-7	-5	-3	-1	1	3

- Create a scatterplot of the data.
- Write the functions and the corresponding domains (a piecewise function) that could be used to model this data.
- Compare and contrast the interpretation of the coefficients and constants of both functions.
- Another student decided to model this data with an absolute value function. Describe how you could create their model based from the graph of $f(x) = |x|$ and using transformations.

Problem 3: Write the piecewise function for the given graph.



(continued on back)

Problem 4: Using x to represent time and y to represent distance from home, create a piecewise function and a graph that represents a realistic morning exercise routine with the following criteria:

(Assume that the person is moving in a straight line away from and back to home.)

- 1) Starts out walking from home for 5 minutes
- 2) Jogs for the next 20 minutes
- 3) Stops to get a drink of water for 1 minute
- 4) Turns around and jogs back towards home for 15 minutes
- 5) Walks back home for 10 minutes.

