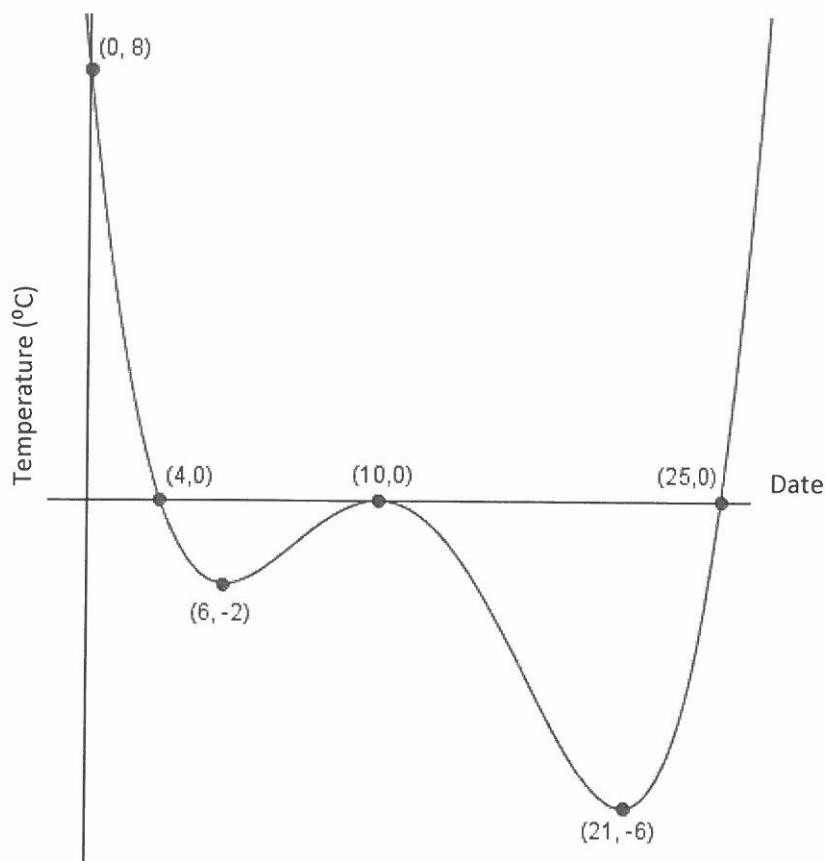


Heat Wave

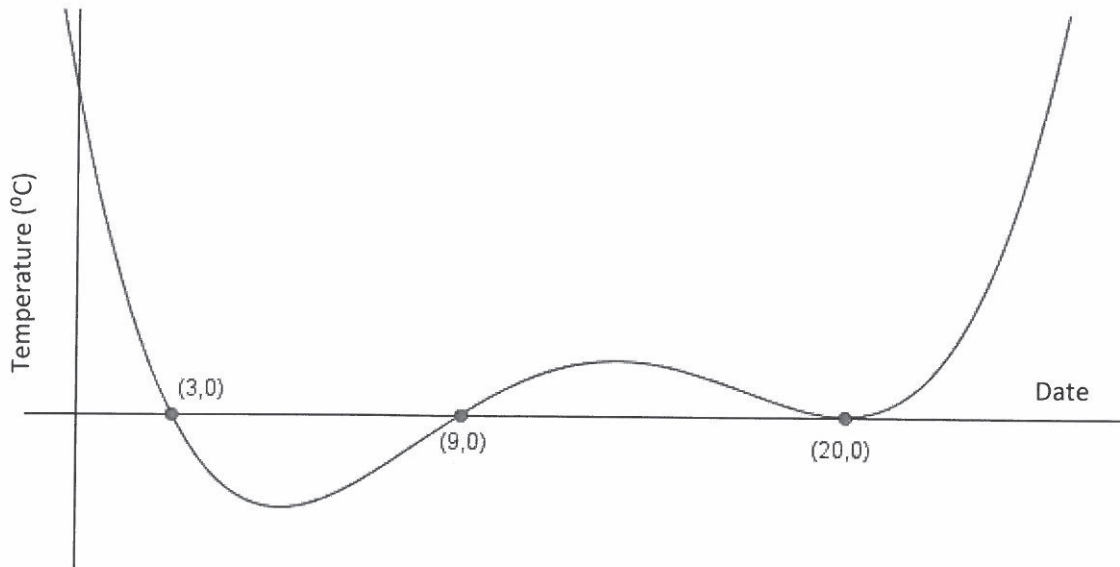
The town of Frostburg experienced a bit of a heat wave during January of this year. The graph below shows the curve of best fit that represents the low temperature for every day in January.



A newspaper journalist is writing a story on the weather and needs to report some information. He needs a bit of guidance with interpreting the graph.

- 1) Write a few sentences describing the key characteristics of the graph as it relates to the context of the problem. Be sure to include domain, range, intervals where the function increases and decreases, x- and y-intercepts, and any other important information.

The graph below shows the curve of best fit that represents the low temperature for every day in February.



- 2) Three different models have been proposed that could be used to determine the temperature for a particular date in February. The models are given below:

Model 1: $y = ax^2 + bx + c$

Model 2: $y = a(x + 3)(x + 9)(x + 20)$

Model 3: $y = \frac{a}{(x-3)(x-9)^2(x-20)}$

None of these models are completely appropriate for the graph. Explain what is incorrect with each of the models and then suggest and justify a better model.