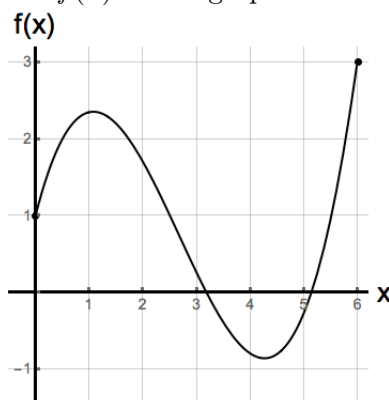**4.** [10 points]

  a. [4 points] Consider the function $f(x)$ whose graph is shown below.

  Use the graph to answer the following questions. Your answers below should be written using interval notation or inequalities.

  Solution:

  i) For which values of x is the function $f(x)$ decreasing? $1.1 < x < 4.2$.

  ii) For which values of x is the function $f(x)$ concave up? $2.5 < x < 6$.

  b. [6 points] Determine which of the listed attributes could be true for the following functions on the entire domain given. Circle all the attributes that could be true and if none of the listed attributes can be true, circle "NONE OF THESE"

  i) Some of the values of the function $g(x)$ are shown in the table below

x	2	4	6	8
$g(x)$	1000	10	2	1

  then $g(x)$ could be:

  Solution:

  | INCREASING | DECREASING | EXPONENTIAL |

  | CONCAVE UP | CONCAVE DOWN | NONE OF THESE |

  ii) On a hot summer day, Pete buys ice cream. He forgets the ice cream in his car where the ice cream starts to warm up very rapidly at first, but then it warms up more slowly as its temperature gets closer to the car's temperature. Let $h(t)$ be the temperature of the ice cream t minutes after it was left in the car. Then $h(t)$ could be:

  Solution:

  | INCREASING | DECREASING | LINEAR |

  | CONCAVE UP | CONCAVE DOWN | NONE OF THESE |