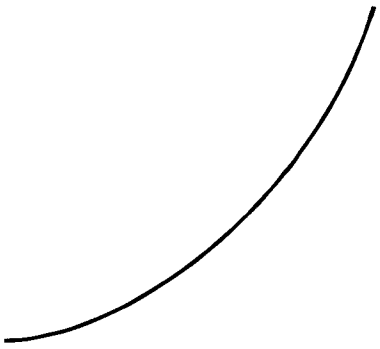
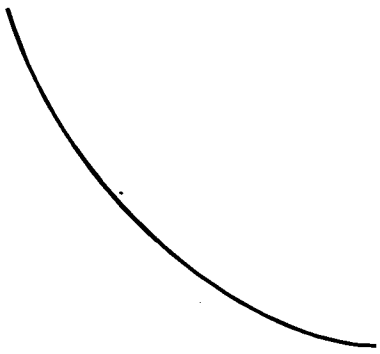
Group Work 1, Section 2.9
The Major Curve Pieces

1. What can we say about g, g', and g'' for each of these segments of the graph of $y = g(x)$?

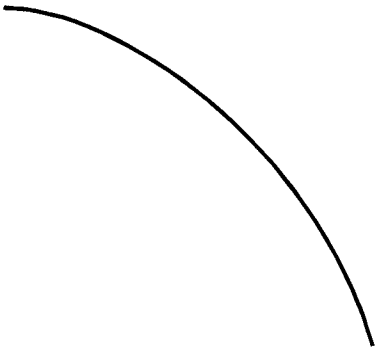
(a)



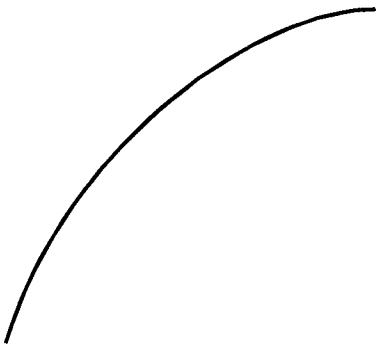
(b)



(c)

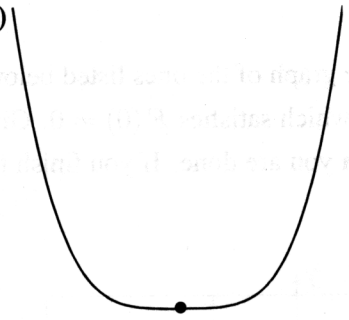


(d)

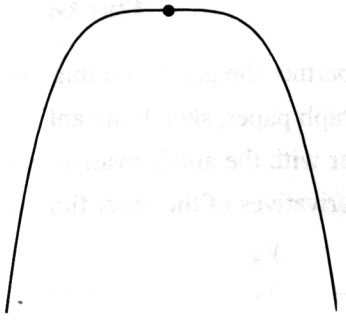


2. What can we say about g, g', and g'' at each of the following points on the graph of $y = g(x)$?

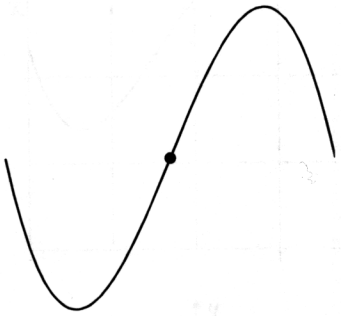
(a)



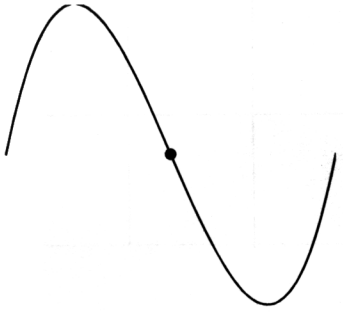
(b)



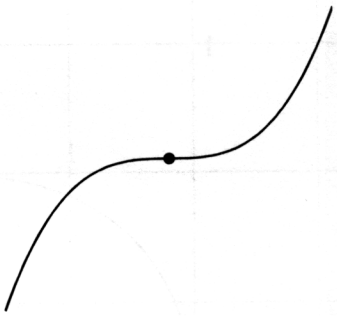
(c)



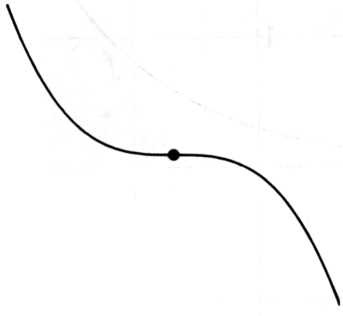
(d)



(e)



(f)



ANSWERS

1. (a)
   - g is increasing
   - g is concave up
   - g' is positive
   - g' is increasing
   - g'' is positive

   (b)
   - g is decreasing
   - g is concave up
   - g' is negative
   - g' is increasing
   - g'' is positive

   (c)
   - g is decreasing
   - g is concave down
   - g' is negative
   - g' is decreasing
   - g'' is negative

   (d)
   - g is increasing
   - g is concave down
   - g' is positive
   - g' is decreasing
   - g'' is negative

2. (a)
   - g has a local minimum
   - g is concave up
   - g' is zero
   - g' is increasing
   - g'' is positive

   (b)
   - g has a local maximum
   - g is concave down
   - g' is zero
   - g' is decreasing
   - g'' is negative

   (c)
   - g is increasing
   - g has an inflection point
   - g' is positive
   - g' has a local maximum
   - g'' is zero

   (d)
   - g is decreasing
   - g has an inflection point
   - g' is negative
   - g' has a local minimum
   - g'' is zero

   (e)
   - g is flat
   - g has an inflection point
   - g' is zero
   - g' has a local minimum
   - g'' is zero

   (f)
   - g is flat
   - g has an inflection point
   - g' is zero
   - g' is has a local maximum
   - g'' is zero

Group Work 2: The Graph Game

This group work allows students to practice sketching f from f' using antiderivative ideas. Once both partners have sketched their antiderivatives, they should trade graphs and then sketch the *derivative* of the function their partner drew. At the end of the exercise they should compare their graphs to the original functions. If a pair finishes early, ask why this exercise would not work as well if the first person took the derivative, and the second did the antiderivative. If they don't know, have them try it with $y = |x| - 2$.

ANSWERS

VERSION A