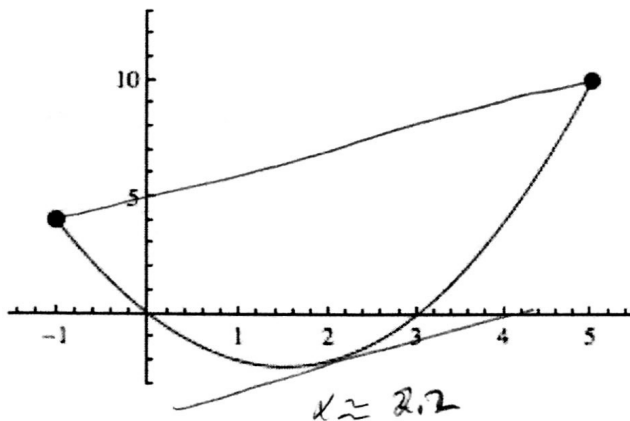


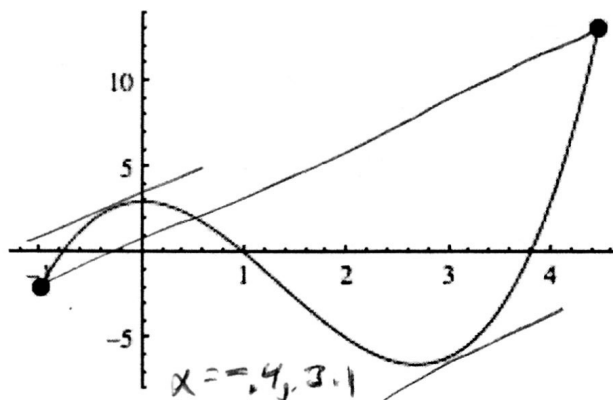
For each graph, do each of the following.

- Draw the secant line connecting the two endpoints given.
- Draw all tangent lines (if they exist) that are parallel to the secant line drawn in (a).
- Estimate the x -coordinates of any points of tangency for the tangent lines drawn in (b).

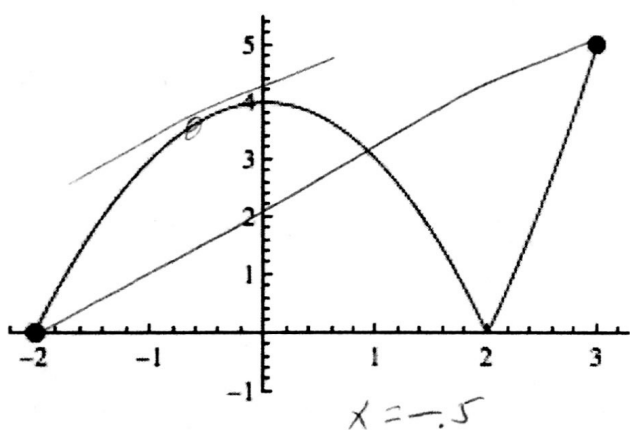
(1)



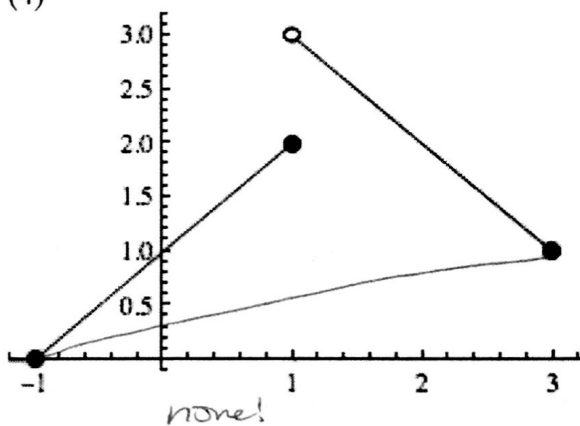
(2)



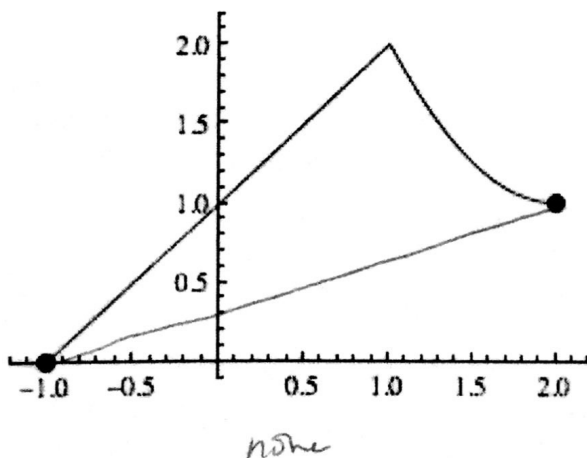
(3)



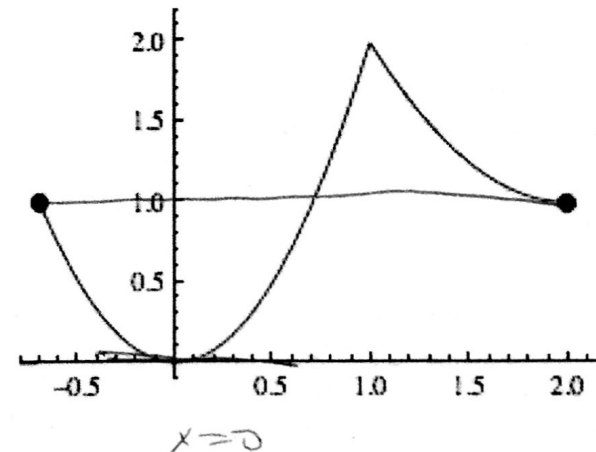
(4)



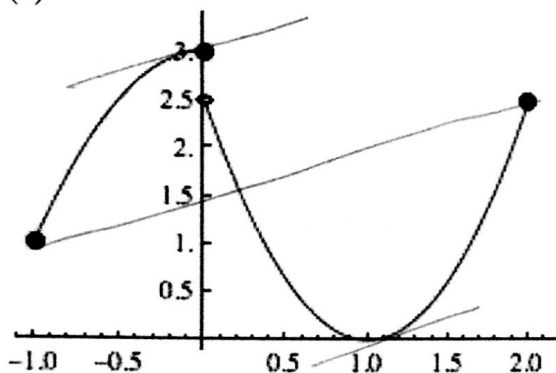
(5)



(6)

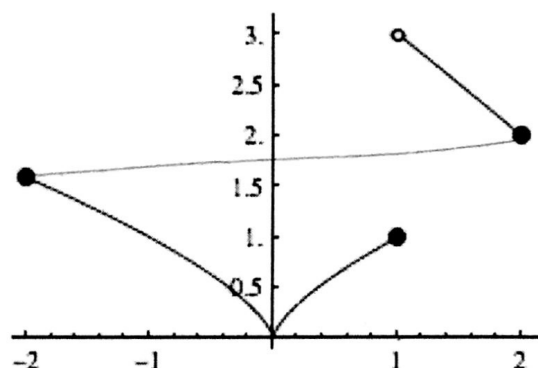


(7)



$$x = -0.1, 1.1$$

(8)



none

- (a) For which of the graphs were you able to draw at least one tangent line?

1, 2, 3, 6, 7

- (b) Which of those graphs listed in (a) above are continuous?

1, 2, 3, 6

- (c) Which of those graphs listed in (b) above are differentiable for all $x \in [a, b]$?

1, 2

- (d) What characteristic(s) – continuity or differentiability – guarantee that you can draw at least one tangent line parallel to the secant line?

diff (implies cont)

In general, for a function f on a closed interval $[a, b]$ and for $x = c$, the x -coordinate of the tangent line, write an equation that equates the slope of the secant line through the endpoints and the slope of the tangent line.

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

inst rate of change = avg rate of change