

FINDING THE DERIVATIVE FUNCTION FROM A GRAPH

A. ITEMS NEEDED

graph of function, straight edge, graph paper

B. PROCESS

1. Using a straight edge, draw tangent lines to the graph of the function at specified points on the curve.
2. Calculate the slope of each of the tangent lines drawn.
3. Plot the values of the calculated slopes, and sketch the graph of the derivative.

C. OBJECTIVE

To compute the derivative of a function defined by a graph using the notion of the equality of the instantaneous rate of change with the slope of the tangent line.

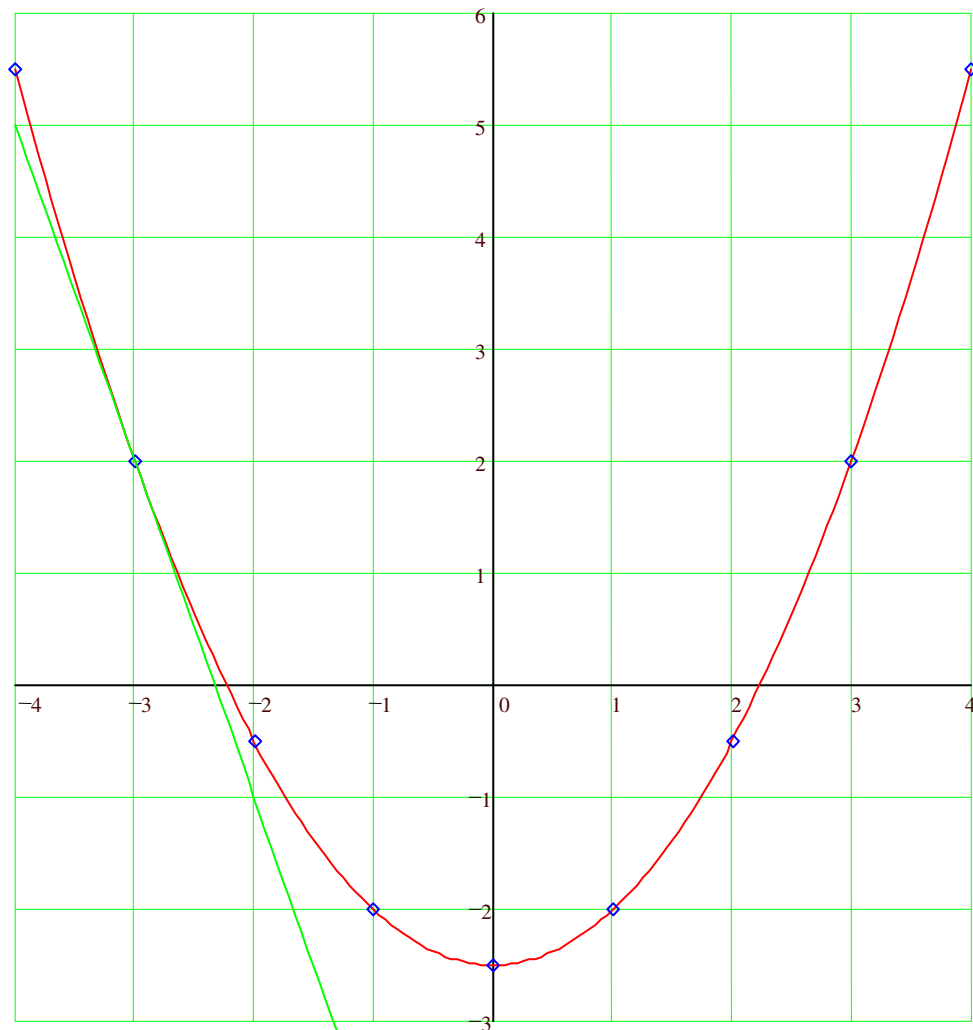
D. RATIONALE

In this exercise, students will be equating the notions of the derivative with the slope of the tangent line to the graph. Topics for discussion can include accuracy of measurement involved in this technique as well as the validity of connecting the points of the derivative which have been graphed with a smooth curve.

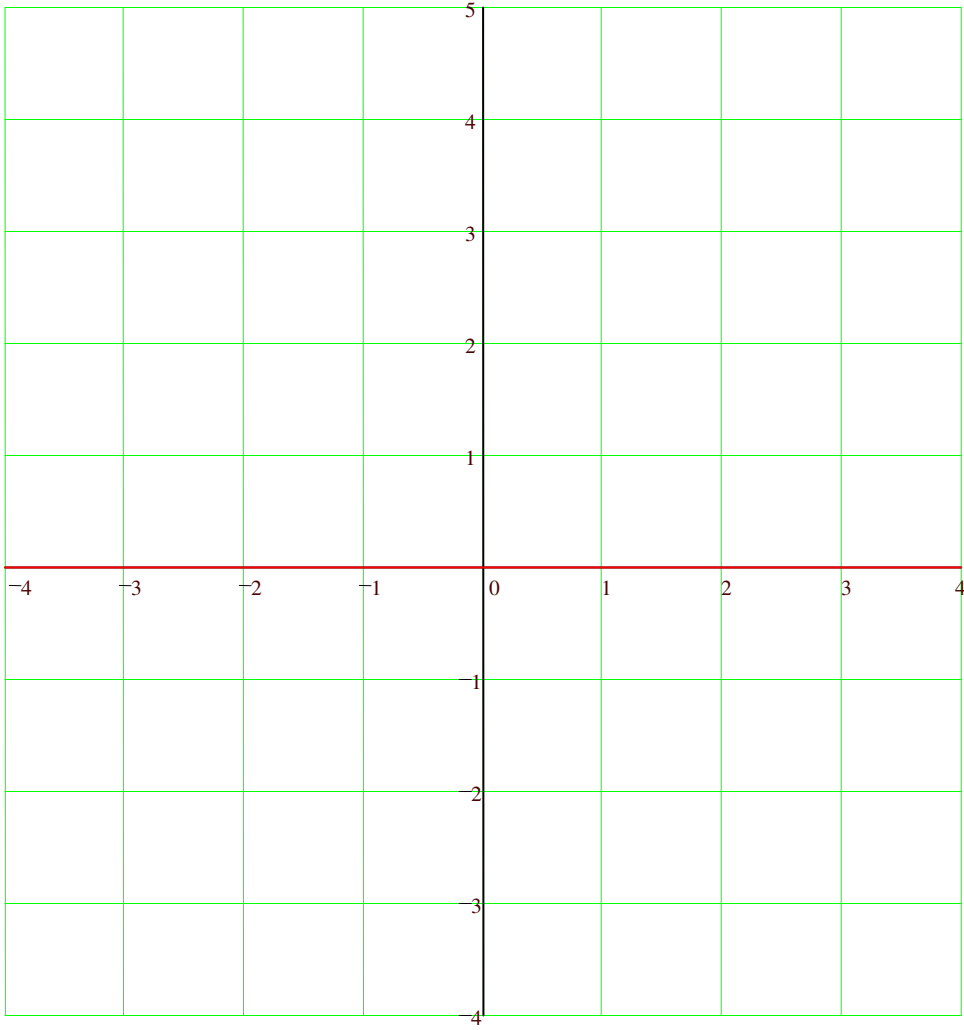
FINDING THE DERIVATIVE FUNCTION FROM A GRAPH

Procedure: The graph of a function is drawn below for you.

1. Using a straight edge, draw tangent lines to the graph of the function at specified points on the curve. One tangent line is drawn for you.
2. Calculate the slope of each of the tangent lines drawn.
3. Plot the values of the calculated slopes, and sketch the graph of the derivative on the graph paper provided by joining the points with a smooth curve.



Sketch the graph of the derivative on the graph provided below.



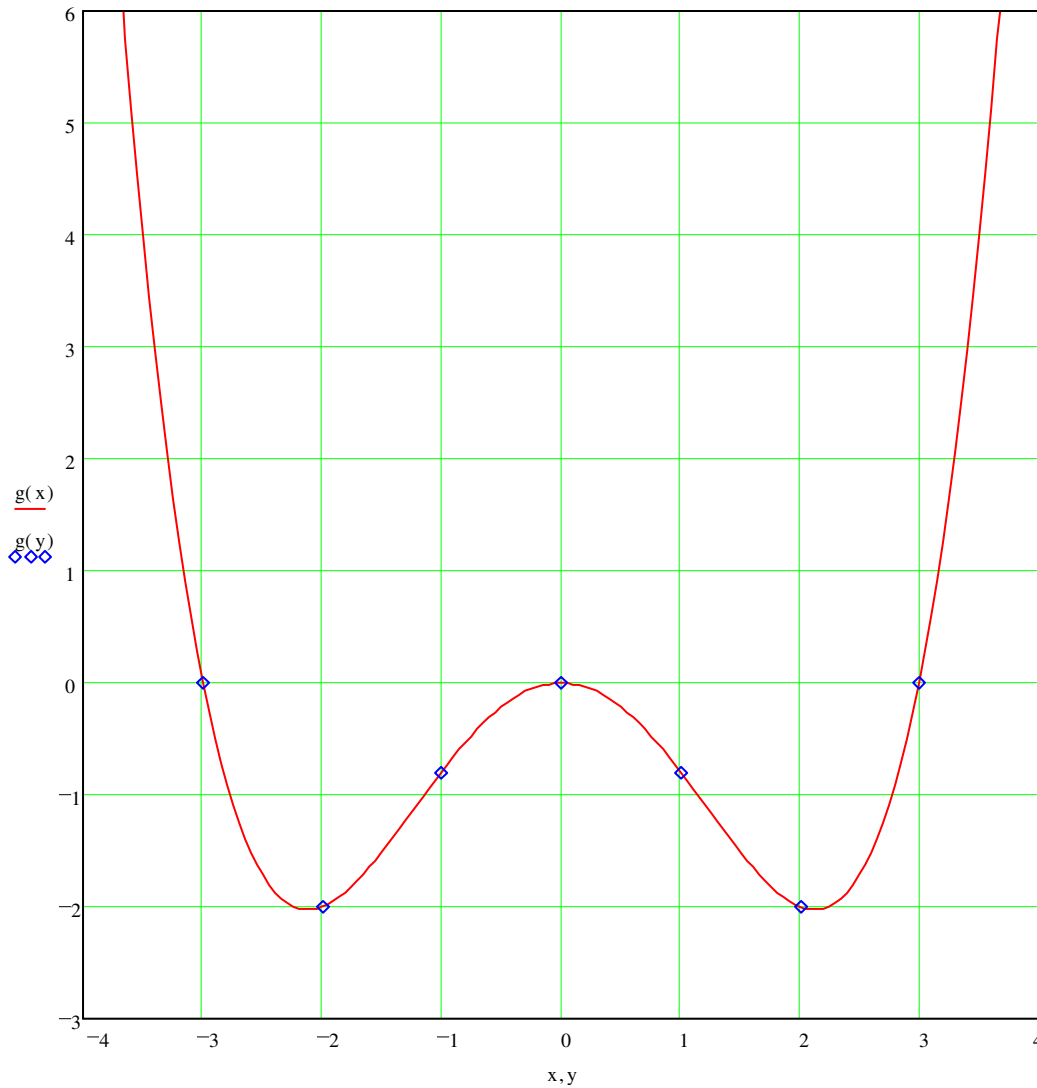
B. QUESTIONS

1. Describe the general shape of the derivative graph.
2. Locate any x -intercepts of the derivative graph, and describe the characteristics of the original function at those same values of x .
3. Locate all intervals on which the original function's graph is increasing and describe the characteristics of the derivative over those same intervals. Locate all intervals on which the original function's graph is decreasing and describe the characteristics of the derivative over those same intervals.

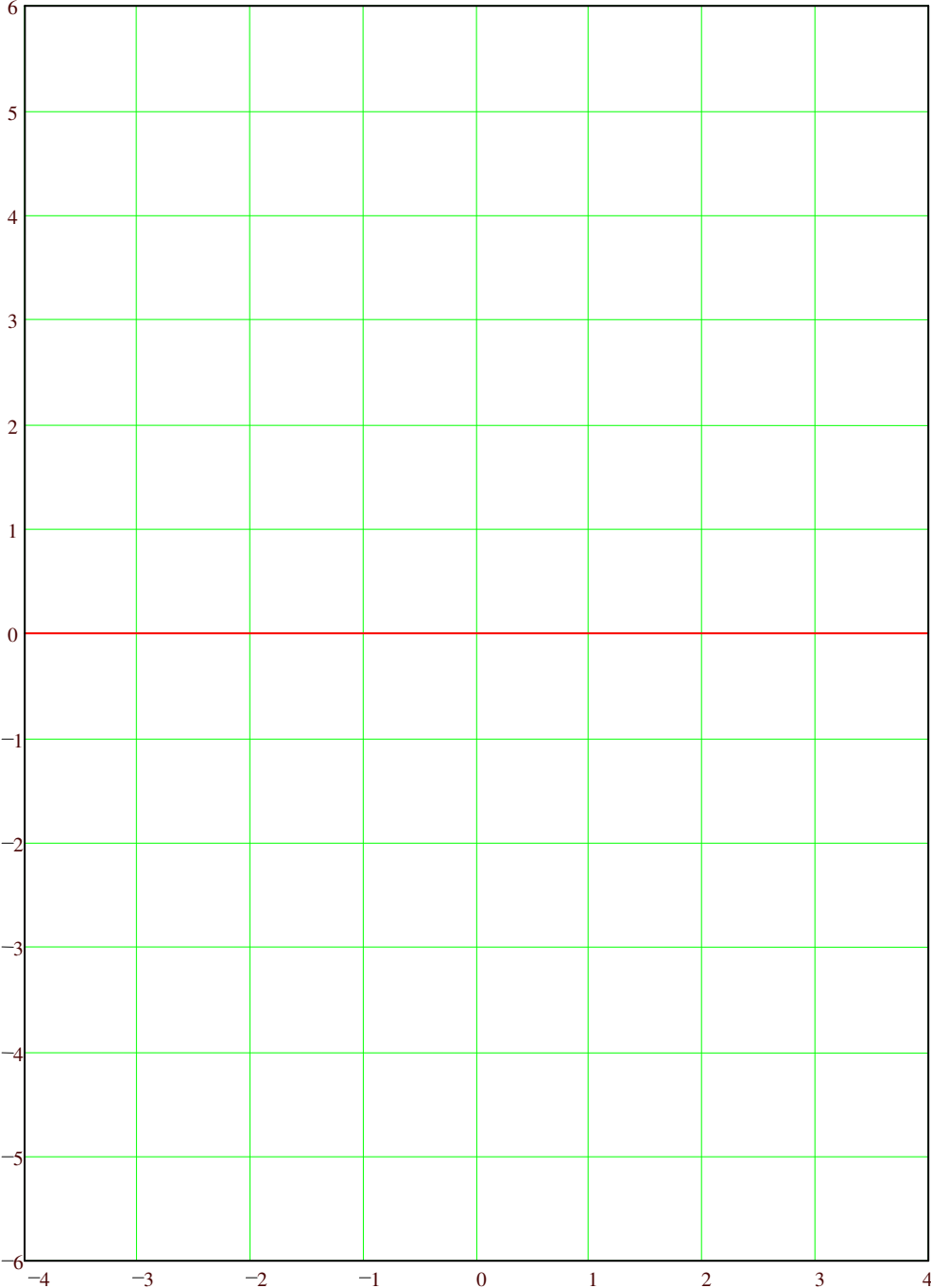
FINDING THE DERIVATIVE FUNCTION FROM A GRAPH

Procedure: The graph of a function is drawn below for you.

1. Using a straight edge, draw tangent lines to the graph of the function at specified points on the curve.
2. Calculate the slope of each of the tangent lines drawn.
3. Plot the values of the calculated slopes, and sketch the graph of the derivative on the graph paper provided by joining the points with a smooth curve.



Sketch the graph of the derivative on the graph provided below.



B. QUESTIONS

1. Describe the general shape of the derivative graph.
2. Locate any x -intercepts of the derivative graph, and describe the characteristics of the original function at those same values of x .
3. Locate all intervals on which the original function's graph is increasing and describe the characteristics of the derivative over those same intervals. Locate all intervals on which the original function's graph is decreasing and describe the characteristics of the derivative over those same intervals.