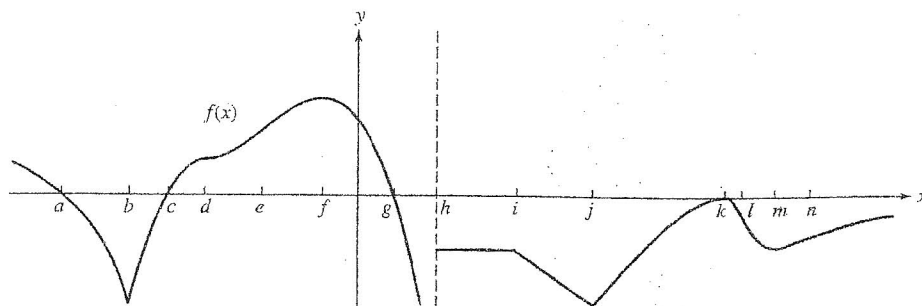


4.1 Concepts Worksheet**An Unusual Function**

1. The function f drawn above would be difficult to describe algebraically; nevertheless, it has interesting geometric features for which calculus provides descriptions. Using the textbook definitions and some freedom of artistic judgment, name the value(s) of x for:

(a) zeros of $f(x)$ _____

(b) points of discontinuity of f _____

(c) critical points _____

(d) intervals over which f increases _____

(e) intervals over which f decreases _____

(f) relative maxima _____

(g) absolute maxima _____

(h) relative minima _____

(i) absolute minima _____

(j) intervals over which f is concave up _____

(k) intervals over which f is concave down _____

(l) points of inflection _____

2. (a) Find the equation of any horizontal asymptotes

(b) Find the equation of any vertical asymptote(s)

3. Find the x -coordinate of each point of discontinuity of f' . _____

4. Find the x -coordinate of each critical point of f' . _____

5. Sketch f' on the same graph as f . (You will need to approximate the range extent of $f'(x)$ as you graph.)