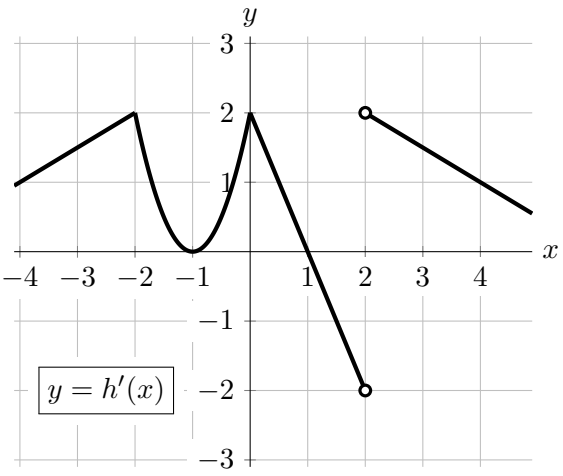
6. [14 points] A table of values for a differentiable function $g(x)$ and its derivative $g'(x)$ are shown below to the left. Below to the right is shown a portion of the graph of $h'(x)$, the derivative of a function $h(x)$. The function $h(x)$ is defined and continuous for all real numbers.

x	-1	0	1	3	4
$g(x)$	0	2	5	1	-7
$g'(x)$	4	3	-1	-6	-3



Answer parts **a.**–**b.**, or write NONE if appropriate. You do not need to show work.

a. [2 points] List the x-coordinates of all critical points of $h(x)$ on the interval $(-4, 4)$.

b. [2 points] List the x-coordinates of all local maxima of $h(x)$ on the interval $(-4, 4)$.

Find the **exact** values for parts **c.**–**e.**, or NEI if there is not enough information to do so. Write DNE if the value does not exist. Your answers should not include the letters g or h but you do not need to simplify. Show work.

c. [2 points] Let $A(x) = \dfrac{\sin(x) + 3}{g(x)}$. Find $A'(0)$.

d. [2 points] Let $f(x) = g(h'(x))$. Find $f'(4)$.

e. [2 points] Let $P(x) = xe^{g(x)}$. Find $P'(-1)$.

Answer parts **f.**–**g.** You do not need to show work.

f. [2 points] Complete the following sentence.

Because the function $g(x)$ satisfies the hypotheses of the mean value theorem on the interval $[-1, 4]$, there must be some point c with $-1 \leq c \leq 4$ such that...

g. [2 points] On which of the following intervals does $h'(x)$ satisfy the hypotheses of the mean value theorem? List all correct answers, or write NONE.

$$[-2, 0] \qquad [-1, 1] \qquad [3, 4]$$

7. [5 points] An implicit function is described by the equation

$$\cos(xy) = 7x^2 + y.$$

Find a formula for $\dfrac{dy}{dx}$ in terms of y and x. You must show every step of your work.