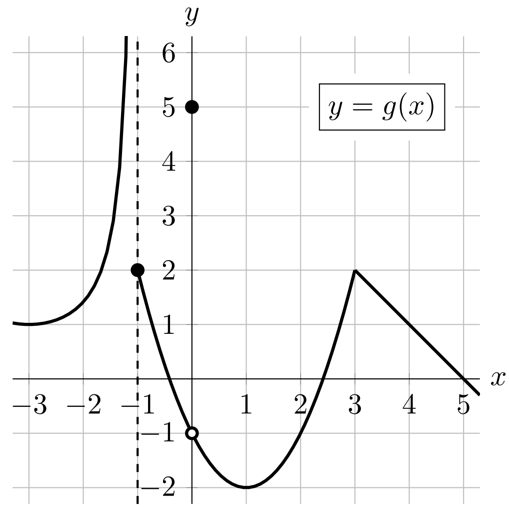
1. [10 points]

A portion of the graph of a function $g(x)$ is shown to the right, along with some values of an invertible, differentiable function $h(x)$ and its derivative $h'(x)$ below. Note that:

- $g(x)$ is linear on $[3, 5]$;
- $g(x)$ has a vertical asymptote at $x = -1$.



x	-2	0	2	4	6
$h(x)$	-1	$-e^{-1}$	0	$\sqrt{2}$	e
$h'(x)$	2	1	π	5	$\sqrt{3}$

a. [2 points] Let $M(x) = x^2 h(x)$. Find $M'(-2)$.

Answer: $M'(-2) =$ ______________

b. [2 points] Let $K(x) = \dfrac{g(x)}{h(x)}$. Find $K'(4)$.

Answer: $K'(4) =$ ______________

c. [2 points] Find $(h^{-1})'(0)$.

Answer: $(h^{-1})'(0) =$ ______________

d. [2 points] On which of the following intervals does $g(x)$ satisfy the <u>hypotheses</u> of the Mean Value Theorem? Circle all correct answers.

$[-3, -1]$ $[0, 2]$ $[1, 3]$ $[2, 4]$ NONE OF THESE

e. [2 points] On which of the following intervals does $g(x)$ satisfy the <u>conclusion</u> of the Mean Value Theorem? Circle all correct answers.

$[-3, -1]$ $[0, 2]$ $[1, 3]$ $[2, 5]$ NONE OF THESE