

3. [14 points] Consider the functions $H(x)$, $G(x)$ and $M(x)$

$$\begin{array}{c|c|c|c|c|c} x & -1 & 0 & 1 & 2 & 3 \\ \hline H(x) & 2 & 3 & -1 & 0 & 1 \end{array} \quad G(x) = \begin{cases} x-2 & -1 < x < 1 \\ 0 & x = 1 \\ x^3 & 1 < x \leq 3 \end{cases} \quad M(x) = \frac{1-x}{2x}$$

Assume that the function H has an inverse.

- a. [8 points] Find the value of the following mathematical expressions. If the expression is undefined, write UNDEFINED.

$$G(1) = \underline{\hspace{2cm}}$$

$$G(H(1)) = \underline{\hspace{2cm}}$$

$$H^{-1}(2) = \underline{\hspace{2cm}}$$

$$H(3G(0) + 5) = \underline{\hspace{2cm}}$$

$$(M(2))^{-1} = \underline{\hspace{2cm}}$$

- b. [3 points] Solve the equation $H(M(x)) = 0$. Show all your algebraic work.

Answer: $\underline{\hspace{2cm}}$

- c. [3 points] What is the average rate of change of $G(x)$ for $-\frac{1}{2} \leq x \leq 3$. Show all your work.

Answer: $\underline{\hspace{2cm}}$