MATH-1951
Quiz 1 - (2.1, 2.2)
Answer the following questions, and show your work. Scientific calculator only.

[1] (4 points total) If a rock is thrown upward on the planet Mars with a velocity of 10 m/s, its height in meters t seconds later is given by \( y = 10t - 1.86t^2 \).
(a) (0.5 pt each) Find the average velocity over the given time intervals:

i) [1,2]

ii) [1,1.5]

iii) [1, 1.1]

iv) [1, 1.01]

v) [1, 1.001]

(b) (1.5 pt) Estimate the instantaneous velocity when \( t = 1 \).
[2] (6 points total) Sketch the graph of an example of a function \( f \) with domain \([-8, 0) \cup (0, 8]\) that satisfies all of the given conditions.

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\begin{align*}
\lim_{x \to 2^-} f(x) &= -2, & \lim_{x \to 2^+} f(x) &= -1, & f(2) &= 0, & \lim_{x \to -5} f(x) &= \infty
\end{align*}
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