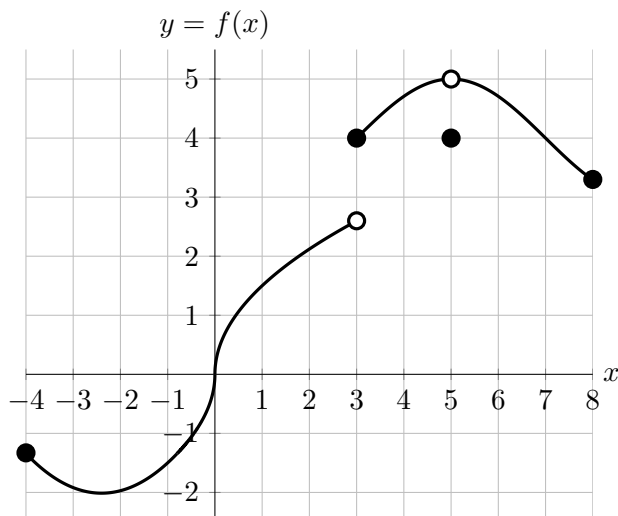


5. [15 points] The graph of the function $f(x)$ with domain $-4 \leq x \leq 8$ is shown below.

The function $f(x)$ satisfies:

- $f(x) = 1.5x^{\frac{1}{3}}$
for $-1 < x < 1$,
- $f(x) = 4 + \sin\left(\frac{\pi}{4}(x - 3)\right)$
for $3 \leq x < 5$ and $5 < x \leq 8$.



a. [2 points] Estimate the x -coordinate(s) of all the local minimum(s) of $f(x)$ in $-4 < x < 8$. Write “NONE” if $f(x)$ does not have any local minimums.

Answer: $x =$ _____

b. [3 points] Find the value(s) of b in $-4 < b < 8$ for which the limit $\lim_{h \rightarrow 0} \frac{f(b+h) - f(b)}{h}$ does *not exist*. Write “NONE” if there are no such values of b .

Answer: $b =$ _____

c. [4 points] Estimate the x -coordinate(s) of all critical points of $f(x)$ in $-4 < x < 8$. Write “NONE” if $f(x)$ does not have any critical points.

Answer: $x =$ _____

d. [3 points] On which of the following intervals is the *conclusion* of the Mean Value Theorem true? Circle your answer(s).

[−4, 0] [0, 5] [1, 3] [3, 7] NONE

e. [3 points] On which of the following intervals are the *hypotheses* of the Mean Value Theorem true? Circle your answer(s).

[−3, −1] [−2, 2] [0, 2] [3, 5] NONE