IN CLASS REVIEW
TEST 1

1. Given the graph of \( f(x) \):
   - Find where \( f(x) \) has critical or stationary points.
   - Find where \( f(x) \) is increasing.
   - Find where \( f(x) \) is decreasing.
   - Find where \( f(x) \) has a relative minimum.
   - Find where \( f(x) \) has a relative maximum.

\[ x = 6 \]

2. Use the graph to find the limits:
   - For what values of \( x \) does \( \lim g(x) \) not exist.
   - Find \( \lim g(x) \) when \( x \to 2 \).
   - Find \( \lim h(x) \) when \( x \to 3 \).
   - Find \( \lim k(x) \) when \( x \to 4 \).

\[ \lim g(x) = -4 \]
\[ \lim h(x) = 1 \]

3. Use the definition to find the derivative.
   \[ \lim_{h \to 0} \frac{f(x+h) - f(x)}{h} \]

\[ \lim_{h \to 0} \frac{3(x+h)^2 - 4(x+h) - 1080}{h} = \]

\[ h \to 0 \]
\[ \lim_{h \to 0} \frac{6(x+h) - 4x - 1080}{h} = \]

\[ \lim_{h \to 0} \frac{6x + 6x - 1080}{h} = \]

\[ \lim_{h \to 0} \frac{12x}{h} = \]

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\[ 0 \]

**MONTGOMERY COUNTY COMMUNITY COLLEGE**

1. Given the graph of \( f(x) \), estimate:
   - \( a = 4 \)
   - \( b = 5 \)
   - \( c = \) \( \frac{5}{2} \)
   - \( d = \) \( \frac{7}{2} \)

2. Given the graph of \( f(x) \), graph \( f(x) \) and \( f''(x) \).

\[ \frac{d^2y}{dx^2} = \]

\[ \frac{2}{x} \]

\[ \frac{1}{x} \]
5. Why is an inflection point a relative extreme of \( f(x) \)?

6. If \( f(x) > 0 \), what does this say about \( f(x) \)?

7. If \( f(x) \) is a relative extreme, then \( f(x) = 0 \).