MA 16010: Applied Calculus 1 Quiz 9 (Solutions) Wed. Oct. 27, 2021

Please show **all** your work! Answers without supporting work will not be given credit. Write answers in spaces provided.

Name:_____

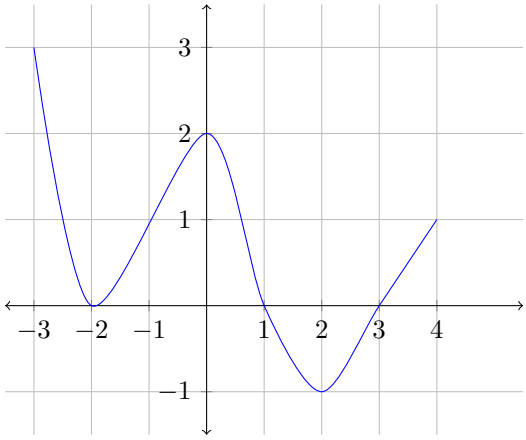
1. **[2 pts]** Find the following limit:

$$\lim_{x\to\infty} \frac{100x^2+25x+1}{81x^2+1}$$

Solution: By the general rule,

$$\lim_{x\to\infty} \frac{100x^2+25x+1}{81x^2+1} = \lim_{x\to\infty} \frac{100x^2}{81x^2} = \lim_{x\to\infty} \frac{100}{81} = \boxed{\frac{100}{81}}$$

2. **[8 pt]** Given the graph of $f'(x)$ below, answer the following question for $f(x)$.



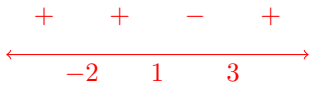
(a) **[1 pt] Critical Number(s):**
$x = -2, 1, 3$

(b) **[1 pt] Increasing Interval(s):**
$(-\infty, 1) \cup (3, \infty)$

(c) **[1 pt] Decreasing Interval(s):**
$(1, 3)$

(d) **[1 pt] Relative Maximum Occurs:**
$x = 1$

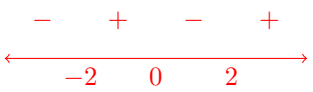
(e) **[1 pt] Relative Minimum Occurs:**
$x = 3$



f'

(f) **[1 pt] Concave Up Interval(s):**
$(-2, 0) \cup (2, \infty)$

(g) **[1 pt] Concave Down Interval(s):**
$(-\infty, -2) \cup (0, 2)$



f''

(h) **[1 pt] Inflection Point(s):**
$x = -2, 0, 2$