

4. [4 points] Evaluate the following limits. No justification necessary. Write DNE if a limit does not exist or diverges to $\pm\infty$.

i. $\lim_{x \rightarrow \infty} \frac{(3x^2 + 1)(x^3 - 2x + 5)}{1 - x - x^2 - x^3 - x^4}$

Answer: _____

ii. $\lim_{x \rightarrow \infty} \frac{\ln x}{\sqrt{x}}$

Answer: _____

iii. $\lim_{x \rightarrow \infty} \left(\frac{xe^{-x} + e^x}{xe^{-x} - e^x} \right)$

Answer: _____

iv. $\lim_{x \rightarrow \infty} \frac{(3 + x^{-1})^2 - 9}{x^{-1}}$

Answer: _____

5. [6 points] A portion of the graph of the differentiable function $f(x)$ is shown below to the right. Using this graph, put the eight quantities (a) through (h) *in order from least to greatest* by writing the letters on the blanks. You are given that $f(x)$ is quadratic on the interval $(2, 4)$.

(a) $f'(0)$ (c) $f'(2)$

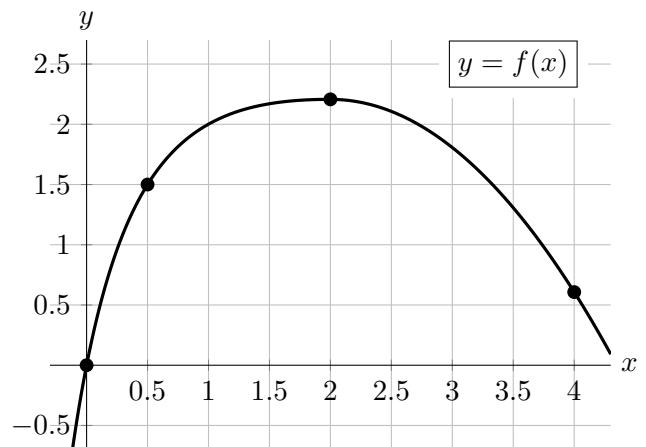
(b) $f'(0.5)$ (d) $f''(3)$

(e) the average rate of change of $f(x)$ over $[0, 0.5]$

(f) the average rate of change of $f(x)$ over $[0.5, 2]$

(g) the average rate of change of $f(x)$ over $[0, 4]$

(h) the number 1



Answer: _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____

LEAST

GREATEST