

Quiz 4 will cover the following topics: all topics from Quiz 1, 2, and 3, rules of exponents, logarithms 1, and limits at infinity and minus infinity.

Review Problems

1. Simplify each of the following.

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|----------------|------------------|---------------------------------------|---|
| a) -3^{-2} | e) $\log_{81} 3$ | i) $\log_6 216$ | m) $9^{\log_3 7}$ |
| b) $(-3)^{-2}$ | f) $\log_5 1$ | j) $\log_{49} 7$ | n) $5^{\log_{25} 36}$ |
| c) $81^{-3/4}$ | g) $\log_5 0$ | k) $\log_4 \left(\frac{1}{32}\right)$ | o) $\log_8 \left(\frac{1}{16}\right)$ |
| d) $16^{7/4}$ | h) $\log_m m^4$ | l) $\log_8 16$ | p) $\log_{27} \left(\frac{1}{9}\right)$ |

2. Find each of the following limits.

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|--|--|---|
| a) $\lim_{x \rightarrow -\infty} (-7x^5 + x^3)$ | f) $\lim_{x \rightarrow -\infty} \log_2 x$ | k) $\lim_{x \rightarrow \infty} 2^x$ |
| b) $\lim_{x \rightarrow \infty} (-7x^5 + x^3)$ | g) $\lim_{x \rightarrow \infty} \frac{2x^2 + 3x + 1}{3x^2 - 5x + 2}$ | l) $\lim_{x \rightarrow -\infty} 2^x$ |
| c) $\lim_{x \rightarrow -\infty} (-7x^5 + x^6)$ | h) $\lim_{x \rightarrow \infty} \frac{11x^5 - 3x - 2}{2x - 24x^8}$ | m) $\lim_{x \rightarrow \infty} \log_2 x$ |
| d) $\lim_{x \rightarrow \infty} (-7x^5 + x^6)$ | i) $\lim_{x \rightarrow \infty} \frac{2x^2 + 3x^4 + 1}{3x^2 - 5x^4 + 2}$ | n) $\lim_{x \rightarrow \infty} \log_{1/2} x$ |
| e) $\lim_{x \rightarrow -\infty} \frac{2x^2 - 8}{7x^2 - 5x + 2}$ | j) $\lim_{x \rightarrow \infty} \frac{-8x^7 + x + 5}{3x - 12}$ | |

Review Problems - Answers

1. See handout Logarithms 1 and Sections A.1, 4.1, and 4.2

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|-------------------|------------------|-------------------|-------------------|------------------|-------|--------------|-------------------|-------------------|
| a) $-\frac{1}{9}$ | b) $\frac{1}{9}$ | c) $\frac{1}{27}$ | d) 128 | e) $\frac{1}{4}$ | f) 0 | g) undefined | | |
| h) 4 | i) 3 | j) $\frac{1}{2}$ | k) $-\frac{5}{2}$ | l) $\frac{4}{3}$ | m) 49 | n) 6 | o) $-\frac{4}{3}$ | p) $-\frac{2}{3}$ |

2. See Section 1.5.

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|---|------------------|-------------|-------------------|------------------|
| a) ∞ | b) $-\infty$ | c) ∞ | d) ∞ | e) $\frac{2}{7}$ |
| f) N/A, the function is not defined on negative numbers | g) $\frac{2}{3}$ | h) 0 | i) $-\frac{3}{5}$ | |
| j) $-\infty$ | k) ∞ | l) 0 | m) ∞ | n) $-\infty$ |