Math 124, Fall 2018, Solutions to Quiz 3

Evaluate the following limits. You answer should be a number, DNE, ∞ or ∞. You may have to show one sided limits to conclude DNE. You can use your calculator to verify your answers but you will be graded on algebra and proper use of limit properties.

1. $\lim_{x\to 5} \frac{\frac{1}{x}-\frac{1}{5}}{x-5} = \lim_{x\to 5} \frac{\frac{5-x}{5x}}{x-5} = \lim_{x\to 5} \frac{5-x}{5x(x-5)} = \lim_{x\to 5} \frac{-1}{5x} = -\frac{1}{25}$

2. $\lim_{x\to\infty} \frac{\sqrt{1+8x^6}}{4-x^3} = \lim_{x\to\infty} \frac{\frac{\sqrt{1+8x^6}}{x^3}}{\frac{4-x^3}{x^3}} = \lim_{x\to\infty} \frac{\sqrt{\frac{1+8x^6}{x^6}}}{\frac{4}{x^3}-\frac{x^3}{x^3}} = \lim_{x\to\infty} \frac{\sqrt{\frac{1}{x^6}+\frac{8x^6}{x^6}}}{\frac{4}{x^3}-\frac{x^3}{x^3}} = \lim_{x\to\infty} \frac{\sqrt{\frac{1}{x^6}+8}}{\frac{4}{x^3}-1} = \frac{0+8}{0-1} = -\sqrt{8}$