

1. For each of the following, find the limit if it exists; if the limit does not exist, write "DNE".

(a)  $\lim_{x \rightarrow 5} x$

(e)  $\lim_{x \rightarrow 9} \frac{x - 9}{\sqrt{x} - 3}$

(h)  $\lim_{x \rightarrow 0} \cos x$

(b)  $\lim_{x \rightarrow 5} 7$

(f)  $\lim_{x \rightarrow -7} \frac{\sqrt{x+7}}{x+4}$

(i)  $\lim_{x \rightarrow 5} \frac{\frac{1}{x} - \frac{1}{5}}{x - 5}$

(c)  $\lim_{x \rightarrow 4} \frac{x^2 - 6x + 5}{x^2 - 9}$

(g)  $\lim_{x \rightarrow -3} \frac{x^4 - 16}{x - 4}$

(j)  $\lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h}$

(d)  $\lim_{x \rightarrow 0} \sin x$

2. For each of the following, find the limit if it exists; if the limit does not exist, write "DNE". Use  $\infty$  and  $-\infty$  when appropriate.

(a)  $\lim_{x \rightarrow 5^+} \frac{-7}{x-5}$

(d)  $\lim_{x \rightarrow \infty} \frac{5x^3 - 7x + 1}{4x^3 - 8}$

(g)  $\lim_{x \rightarrow -\infty} \frac{9x^3 - 4x^2 - 5x + 1}{4 - x^2}$

(b)  $\lim_{x \rightarrow -4^-} \frac{2}{x^2 + 4x}$

(e)  $\lim_{x \rightarrow \infty} \frac{2x^3 - 4x^2 + 1}{5x^5 - 8x}$

(h)  $\lim_{x \rightarrow \infty} \tan x$

(c)  $\lim_{x \rightarrow 1^+} \frac{4x}{x^2 - 4x + 3}$

(f)  $\lim_{x \rightarrow \frac{\pi}{2}^+} \tan x$

(i)  $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x$