

substitution "trick" -
change variables between
 x and $\frac{1}{x}$

$$\text{e.g. } \lim_{x \rightarrow -\infty} \sin \frac{1}{x}$$

$$= \lim_{x \rightarrow 0^-} \sin\left(\frac{1}{x}\right)$$

$$= \lim_{x \rightarrow 0^-} \sin x = 0$$

useful technique!

Practice: p. 76

$\lim_{x \rightarrow \infty} f(x)$ | $\lim_{x \rightarrow -\infty} f(x)$ H.A.?

1	1	$y=1$	1. $f(x) = \cos\left(\frac{1}{x}\right)$
0	$-\infty$	$y=0$	3. $f(x) = \frac{e^{-x}}{x} = \frac{1}{x \cdot e^x}$
∞	∞	NO	4. $f(x) = \frac{3x^3 - x + 1}{x + 3}$
$y=3$	$y=-3$	$y=3$ $y=-3$	5. $f(x) = \frac{3x+1}{ x +2}$

p. 76 # 27-30

"describe behavior"

means:

indicate $\lim_{x \rightarrow c^-} f(x) = +$ or $-$
 ∞

and $\lim_{x \rightarrow c^+} f(x) = +$ or $-$
 ∞