Department of
Mathematical Sciences
UNIVERSITY *of* ALASKA ANCHORAGE

Calculating a Limit Using the Squeeze Theorem

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\begin{array}{rcccll}
 & & \displaystyle\lim_{x\to\infty}\frac{\sin x}{x} & & & \\
-1 & \leq & \sin x & \leq & 1. & \text{known property of sine} \\
-\frac{1}{x} & \leq & \frac{\sin x}{x} & \leq & \frac{1}{x}. & \text{match the original function by dividing by } x \\
\displaystyle\lim_{x\to\infty} -\frac{1}{x} & \leq & \displaystyle\lim_{x\to\infty}\frac{\sin x}{x} & \leq & \displaystyle\lim_{x\to\infty}\frac{1}{x}. & \text{match the original by evaluating the limit} \\
0 & \leq & \displaystyle\lim_{x\to\infty}\frac{\sin x}{x} & \leq & 0. & \text{known limit forms} \\
 & & \displaystyle\lim_{x\to\infty}\frac{\sin x}{x} & = & 0. & \text{squeeze theorem}
\end{array}
$$