17. To be proved: $\lim\limits_{x\to 1} \frac{1}{x+1} = \frac{1}{2}$.
Proof: Let $\epsilon > 0$ be given. We have

$$\left|\frac{1}{x+1} - \frac{1}{2}\right| = \left|\frac{1-x}{2(x+1)}\right| = \frac{|x-1|}{2|x+1|}.$$

If $|x-1| < 1$, then $0 < x < 2$ and $1 < x+1 < 3$, so that $|x+1| > 1$. Let $\delta = \min(1, 2\epsilon)$. If $|x-1| < \delta$, then

$$\left|\frac{1}{x+1} - \frac{1}{2}\right| = \frac{|x-1|}{2|x+1|} < \frac{2\epsilon}{2} = \epsilon.$$

This establishes the required limit.