Week 12 FLO (Friday Learning Opportunity)

1. Find each of the following limits:
   (a) $\lim_{x\to\infty} \frac{e^x}{x^2}$
   (b) $\lim_{x\to 0^{(+)}} x\ln(x)$
   (c) $\lim_{x\to-\infty} xe^x$
   (d) $\lim_{x\to\infty} x^{1/x}$
   (e) $\lim_{x\to 0^{(+)}} x^x$
   (f) $\lim_{x\to 0} \frac{\sin(x)-x}{x^3}$
   (g) $\lim_{x\to 0} \frac{\cos(x)-1}{x^2}$
   (h) $\lim_{x\to\infty} \frac{x+\cos(x)}{x}$
2. I need to design a soup can with height h and radius r. The volume V of the can is $V=\pi r^2 h$ and its surface area A is $A=2\pi r^2+2\pi rh$. Let's say the surface area is 2π. Thus $2\pi=2\pi r^2+2\pi rh$. And that makes $1=r^2+2rh$. For the constraint $1=r^2+2rh$, find r and h that maximize the volume $V=\pi r^2 h$.