1. A machinist is required to construct a square metal plate with area 100 cm$^2$.

(a) What length for the sides produces such a square?

(b) If the machinist is allowed an error tolerance of $\pm 1$ cm$^2$ in the area of the disk, how close to the ideal side in part (a) must the machinist control the length of the sides?

(c) In terms of the $\epsilon$, $\delta$ definition of the $\lim_{x \to a} f(x) = L$, what is $x$? What is $f(x)$? What is $a$? What is $L$? What value of $\epsilon$ is given? What is the corresponding value of $\delta$?

(d) If the machinist is required to control the error to within an $\epsilon$ of the desired area, how close to the ideal side should the machinist construct the sides of the square?