Name: _____ Score (Out of 6 points):

1. (6 points) Let (X, d) be a metric space. Fix $x_0 \in X$ and $r > 0$ in $\mathbb{R}$. Show that the set

$$\{x \mid d(x_0, x) \leq r\}$$

is closed. (Note the **weak** inequality in the definition of the set!)