MATH **126** Quiz **Nov. 7,** *the former "Red Day" in Soviet Union* **Name:**

No books, notes or graphing calcuators. Please turn off your cell phones. Show ALL your work.

(5) 1. Find the Cartesian equation of the curve given by the following equation in polar coordinates:

$$r = 2\sin\theta$$

Sketch the curve.

(5) 2. Consider the helix given by the vector equation $\mathrm{r}(t) = (\cos t, \sin t, t)$

(3pt) (a) Find the length of the arc of the helix between the $t = 0$ and $t = 2\pi$ (one revolution).

(2pt) (b) Is parameterization $\mathrm{r(t)} = (\cos \mathrm{t}, \sin \mathrm{t}, \mathrm{t})$ a *natural* parameterization of the helix? If not, give the natural parametrization.