An Alternate Solution

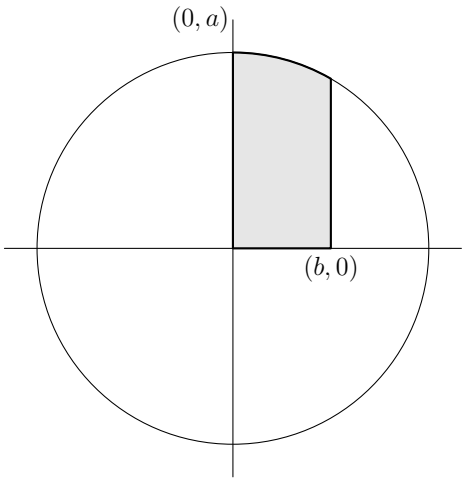

Figure 1: The area of the shaded region is $\displaystyle\int_0^b \sqrt{a^2 - x^2}\, dx$.

As Professor Miller explained in lecture, the area of the region shown in Figure 1 is $\displaystyle\int_0^b \sqrt{a^2 - x^2}\, dx$. Use the substitution $x = a\cos\theta$ to solve this integral. Hint: pay particular attention to your limits of integration.

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