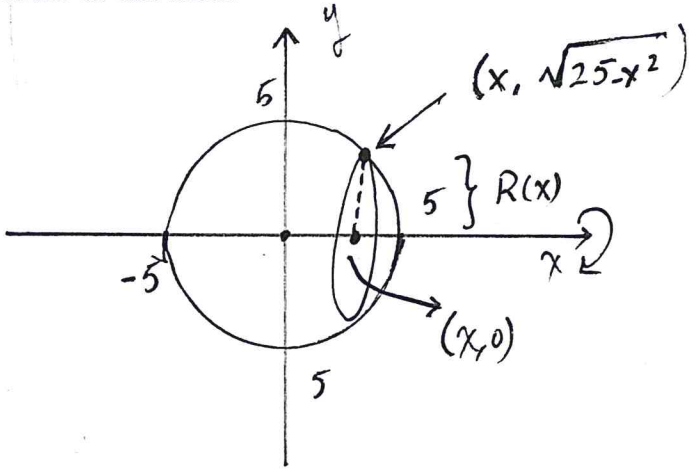
Name: Solution **Section:** 11

Clear your desk of everything except pens, pencils and erasers. **Show all your work.**
If you have a question raise your hand and I will come to you.

1. Find the volume of the solid generated by rotating about the x-axis the region bounded by the curves $y = \sqrt{25 - x^2}$ and $y = 0$.

   (a) (4 points) Draw a picture of the solid.



   (b) (3 points) Write the formula for the area of a cross-section.

$$A(x) = \pi R^2(x)$$
$$= \pi \left(\sqrt{25-x^2}\right)^2$$
$$= \pi (25 - x^2)$$

   (c) (3 points) Set up, **but do not evaluate**, the integral representing the volume of the solid.

$$V = \int_{-5}^{5} \pi (25 - x^2)\, dx$$

OR $$V = 2 \cdot \int_{0}^{5} \pi (25 - x^2)\, dx.$$