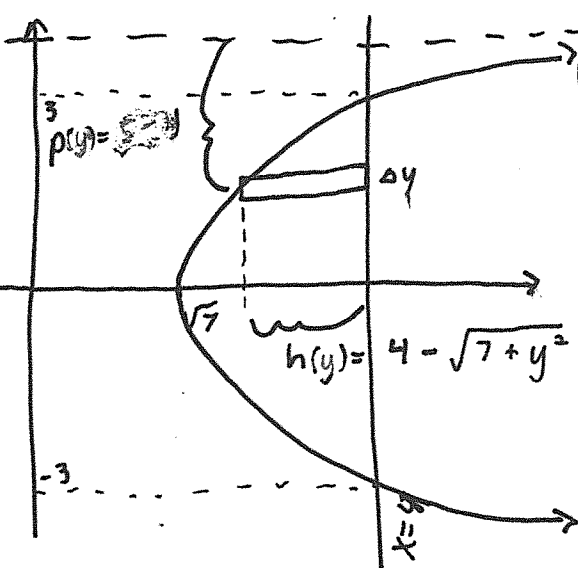


Quiz 9

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. (5 marks) §7.3 #26 Set up an integral for the volume of the solid obtained by rotating the region bounded by the given curves about the specified axis. Sketch the region, draw a representative rectangle, write a representative element and label the sketch completely.

$$x^2 - y^2 = 7, x = 4; \text{ about the } y = 5$$



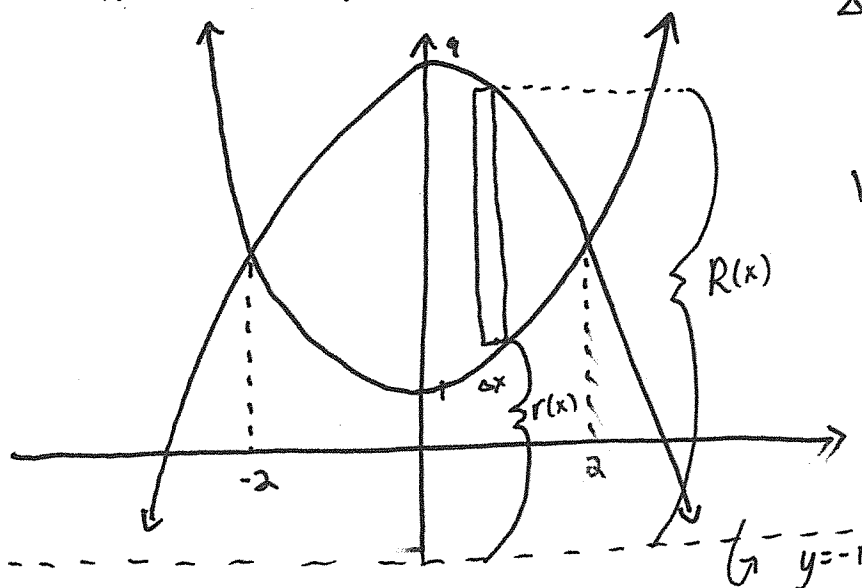
$$\begin{aligned} 4^2 - y^2 &= 7 \\ 4^2 - 7 &= y^2 \\ 16 - 7 &= y^2 \\ 9 &= y^2 \\ \pm 3 &= y \end{aligned}$$

$$\begin{aligned} \Delta V &= 2\pi(y) h(y) \Delta y \\ &= 2\pi(5-y)(4 - \sqrt{7+y^2}) \Delta y \end{aligned}$$

$$V = \int_{-3}^3 2\pi(5-y)(4 - \sqrt{7+y^2}) dy$$

Question 2. (5 marks) Review Chapter 7 #8 Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified axis. Sketch the region, draw a representative rectangle, write a representative element and label the sketch completely.

$$y = x^2 + 1, y = 9 - x^2; \text{ about the } y = -1$$



$$\begin{aligned} \Delta V &= \pi [(R(x))^2 - (r(x))^2] \Delta x \\ &= \pi [(10 - x^2)^2 - (2 + x^2)^2] \Delta x \end{aligned}$$

$$V = \int_{-2}^2 \pi [(10 - x^2)^2 - (2 + x^2)^2] dx$$

$$\begin{aligned} R(x) &= 1 + 9 - x^2 = 10 - x^2 \\ r(x) &= 1 + (x^2 + 1) = 2 + x^2 \end{aligned}$$