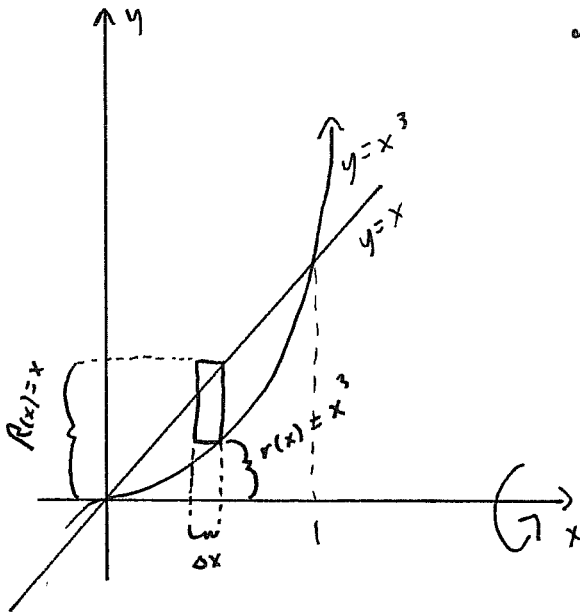


Quiz 9

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.

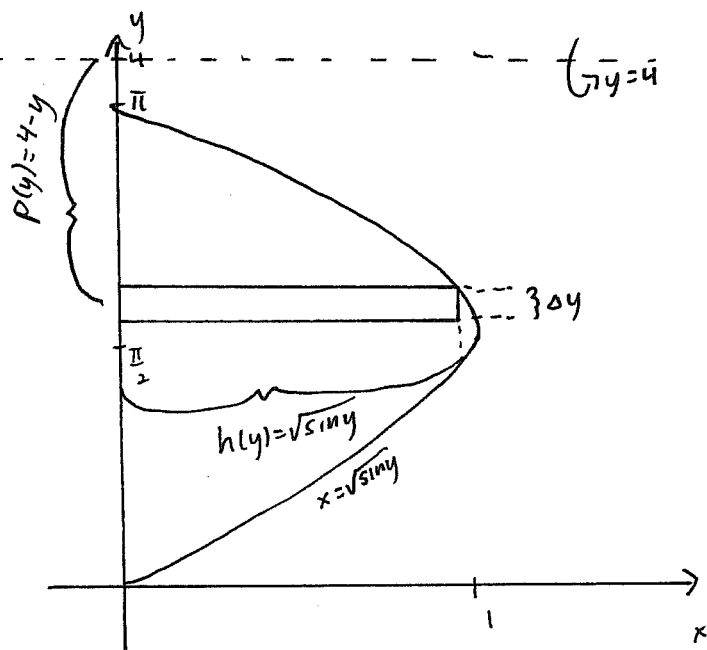
Question 1. (5 marks) §7.2 #5 Find the volume of the solid obtained from the region bounded by the graphs of $y = x^3$, $y = x$, $x \geq 0$, rotated about the x -axis.



$$\begin{aligned} \therefore \Delta V &= \pi \left[(R(x))^2 - (r(x))^2 \right] \Delta x \\ &= \pi \left[x^2 - (x^3)^2 \right] \Delta x \end{aligned}$$

$$\begin{aligned} \therefore V &= \int_0^1 \pi \left[x^2 - x^6 \right] dx \\ &= \pi \left[\frac{x^3}{3} - \frac{x^7}{7} \right]_0^1 \\ &= \pi \left[\frac{1}{3} - \frac{1}{7} \right] = \frac{4\pi}{21} \end{aligned}$$

Question 2. (5 marks) §7.3 #25 Set up the integral to find the volume of the solid obtained from the region bounded by the graphs of $x = \sqrt{\sin y}$, $x = 0$ and $0 \leq y \leq \pi$, rotated about the line $y = 4$.



$$\begin{aligned} \therefore \Delta V &= 2\pi \left[p(y) h(y) \right] \Delta y \\ &= 2\pi (4 - y) \sqrt{\sin y} \Delta y \end{aligned}$$

$$\therefore V = \int_0^{\pi} 2\pi (4 - y) \sqrt{\sin y} dy$$