

7.2 (p 462) #32

1. Find intersections

$$\sqrt{x} = 4 - \frac{x}{2}$$

$$x = 16 - 4x + \frac{x^2}{4}$$

$$x^2 - 20x + 64 = 0$$

$$(x-4)(x-16)$$

GREEN SIDE

$$R = 4 - \frac{x}{2}$$

$$r = \sqrt{x}$$

YELLOW SIDE

$$R = \sqrt{x}$$

$$r = 4 - \frac{x}{2}$$

2. Area of Green & yellow

$$\pi \int_0^4 \left(4 - \frac{x}{2}\right)^2 - (\sqrt{x})^2 dx + \pi \int_4^8 (\sqrt{x})^2 - \left(4 - \frac{x}{2}\right)^2 dx$$

$$\pi \int_0^4 \left(\frac{x^2}{4} - 5x + 16\right) dx + \pi \int_4^8 \left(-\frac{x^2}{4} + 5x - 16\right) dx$$

$$\pi \left(\frac{x^3}{12} - \frac{5x^2}{2} + 16x\right) \Big|_0^4 + \pi \left(-\frac{x^3}{12} + \frac{5x^2}{2} - 16x\right) \Big|_4^8$$

$$\frac{88\pi}{3}$$

$$+ \frac{56\pi}{3}$$

$$48\pi$$

