

4.4 Even Answers

2) Dimensions: base = $\frac{5}{\sqrt{2}}$ height = $\frac{5}{\sqrt{2}}$

$$\text{Area} = \frac{25}{4} \text{ cm}^2$$

4) 2 X 2 rectangle (square)

8) $a = b = \sqrt{200}$

10) 12 meters by 18 meters; Total amount of fence needed = 72 m

14) a) At $t = 0$, the velocity is 96 ft/sec

16) $r = h = \sqrt[3]{\frac{1000}{\pi}}$

18) a) $V(x) = 2x^3 - 25x^2 + 75x$

b) $0 < x < 5$

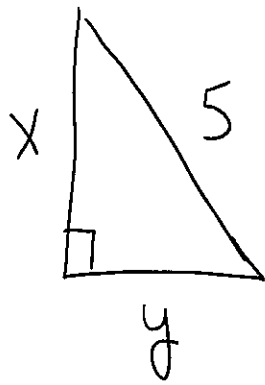
c) $x \approx 1.96$ in; Max Volume ≈ 66.02

26) $x = 12$ cm and $y = 6$ cm (for both a and b)

See the following pages
for selected solutions
worked out in class

12/4/2009

4.4
#2



$$A = \frac{1}{2} x y \quad 0 < x < 5$$

$$A = \frac{1}{2} x \sqrt{25 - x^2}$$

$$A' = \frac{1}{2} x \frac{1}{2\sqrt{25-x^2}}(-2x) + \frac{1}{2} \sqrt{25-x^2}$$

$$0 = -\frac{x^2}{\sqrt{25-x^2}} + \sqrt{25-x^2}$$

$$\frac{x^2}{\sqrt{25-x^2}} = \sqrt{25-x^2}$$

$$x^2 = 25 - x^2 \Rightarrow 2x^2 - 25 = 0$$



$$x = \frac{5}{\sqrt{2}}$$

$$y = \sqrt{25 - \left(\frac{5}{\sqrt{2}}\right)^2}$$

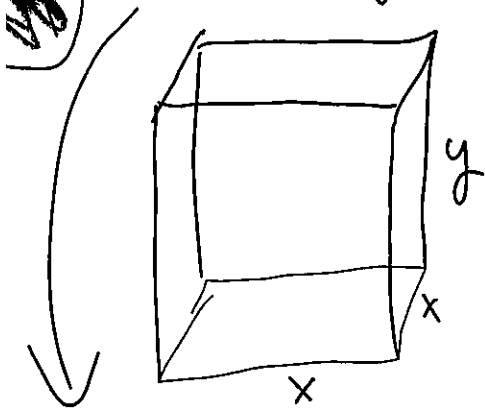
$$= \sqrt{\frac{25}{2}} = \frac{5}{\sqrt{2}}$$

$$A = \frac{1}{2} \left(\frac{5}{\sqrt{2}}\right)^2 =$$

$$\frac{25}{4}$$

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$$V = x^2 y = 500 \text{ ft}^3$$



$$y = \frac{500}{x^2} \quad x > 0$$

$$A = x^2 + 4xy$$
$$= x^2 + 4x \frac{500}{x^2}$$

$$= x^2 + \frac{2000}{x}$$

$$A' = 2x - \frac{2000}{x^2} = 0$$

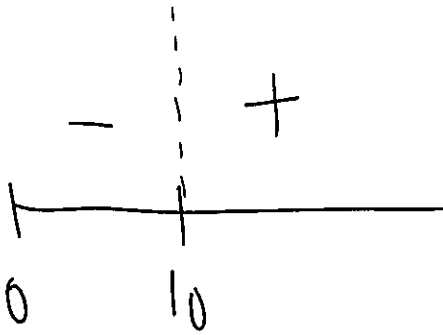
$$2x = \frac{2000}{x^2}$$

$$x^3 = 1000$$

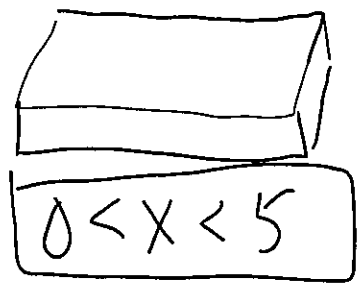
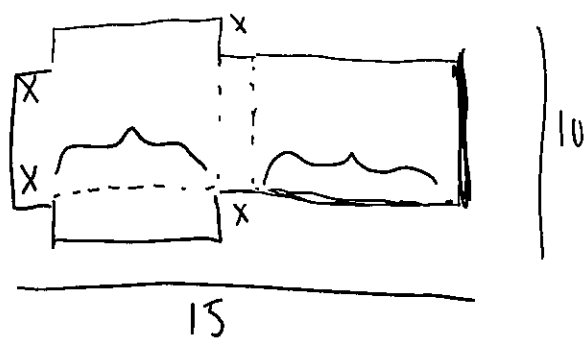
$$x = 10$$

$$y = 5$$

$$10 \times 10 \times 5$$



4.4
18)



$$V = x(10-2x)\left(\frac{15-2x}{2}\right) = x(5-x)(15-2x)$$

$$V = (5x-x^2)(15-2x) = 75x - 10x^2 - 15x^2 + 2x^3$$

$$V = 75x - 25x^2 + 2x^3$$

$$V' = 75 - 50x + 6x^2 = 0$$

$$x = 1.962, \quad \cancel{6.371} \quad \uparrow \downarrow$$

