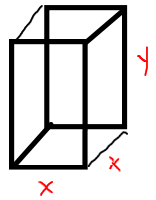


Max/Min Problems (cont'd)

A rectangular open topped storage bin is to have a square base and vertical sides. If 48m^2 of plywood are available for its construction, find the dimensions with the greatest volume.



$$V = lwh$$

$$\rightarrow V = x^2 y$$

$$V = x^2 \left(\frac{48 - x^2}{4} \right)$$

$$V = 12x - \frac{x^3}{4}$$

$$V' = 12 - \frac{3}{4}x^2$$

$$0 = 12 - \frac{3}{4}x^2$$

$$\frac{3}{4}x^2 = 12$$

$$x^2 = 16$$

$$x = \pm 4$$

$$x > 0$$

$$x = 4$$

$$SA = x^2 + 4xy$$

$$48 = x^2 + 4xy$$

$$48 - x^2 = 4xy$$

$$\frac{48 - x^2}{4x} = y$$

$$y = \frac{48}{4x} - \frac{x^2}{4x}$$

$$\frac{12}{x} - \frac{x}{4} = y$$



sub into original eqn $\rightarrow V(4) = 32\text{m}^3$

dimensions $4 \times 4 \times 2$

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* 1, 2, 10, 13, 17

Try 27

$$P(x) = R(x) - C(x)$$

subtract before differentiating