1. Width $= 4$, Height $= 8$. $(-2 \le x \le 2,\ 0 \le y \le 8)$ $A_{max} = 32$.

2. 5 m perpendicular to the river by 10 m parallel to the river. $A_{max} = 50$ m^2.

3. Width $= 10$ in, length $= 20$ in, height $= 20/3$ in. $V_{max} = 4000/3$ in^3.

4. Base $= 4$ in$\times$ 4 in, height $= 2$ in. $A_{min} = 48$ in^2.

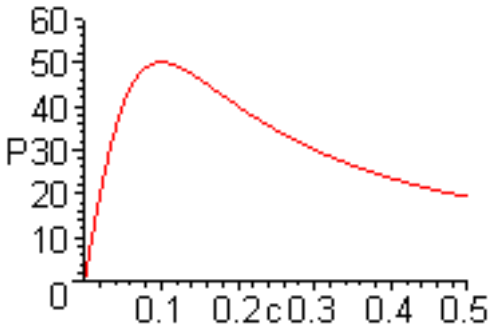
5. Radius of can $= 10/\sqrt[3]{2\pi} \simeq 5.419$ cm, height $= 10\sqrt[3]{4/\pi} \simeq 10.839$ cm.

6. Width $= 2r/\sqrt{3}$, depth $= 2r\sqrt{2/3}$.

7. Maximum reaction at $x = a/2$.

8. a. Optimal concentration $c = 0.1$ M, $P_{max} = 50$ organisms/cm^2.

b.



9. Maximum profit when $x = r/2$ is the harvesting effort, resulting in $K/2$ fish in the population.

Maximum number of fish when harvesting effort $x = 0$, with equilibrium population of fish at K, the carrying capacity.

10. a. Optimal age is $x = e \cdot b^{-1/c}$. For parameters in Part b. this is $x = 0.582$.

b.