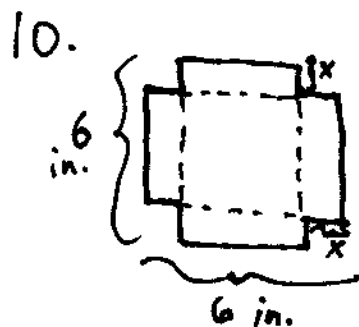


Section 1.1.



a) As seen in the picture, the box formed by folding up the flaps will have length $6-2x$, width $6-2x$, and height x . Volume = length \cdot width \cdot height = $(6-2x)(6-2x)x$

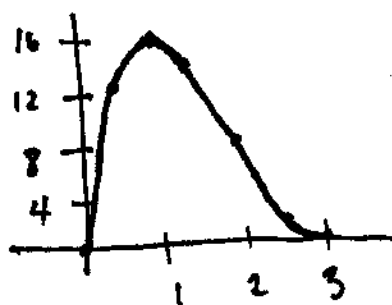
Thus the volume $V = x \cdot (6-2x)^2$

b) Clearly x cannot be less than or equal to 0 — a negative cut simply doesn't make sense. Also, x must be less than three — otherwise there wouldn't be a flap to fold up; we would have cut out all the material.

Thus, $0 < x < 3$

c)

| x | V |
|-----|------|
| 0 | 0 |
| .5 | 12.5 |
| 1 | 16 |
| 1.5 | 13.5 |
| 2 | 8 |
| 2.5 | 2.5 |
| 3 | 0 |



d) It appears to achieve its maximum at

$x = 1 \Rightarrow V_{\max} = 16$