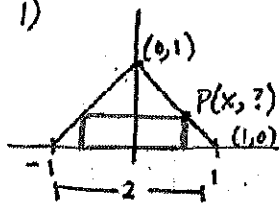


1)



a) $y = -x + 1$

b) $A(x) = 2x(-x + 1) = -2x^2 + 2x$

c) $A'(x) = -4x + 2 = 0$

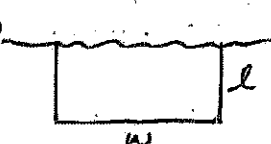
$A''(x) = -4 < 0$

$x = 1/2$

A is always concave down.

A is max when $x = 1/2$.Dimensions: $1 \times 1/2$

2)



$2l + w = 800$

$w = 800 - 2l$

$A = l \cdot w$

$A = l(800 - 2l)$

$A = 800l - 2l^2$

$A' = 800 - 4l = 0$

$l = 200 \text{ m}$

$w = 400 \text{ m}$

$A'' = -4 < 0$

Area is max when

$l = 200 \text{ m} \text{ \& } w = 400 \text{ m}$

Area = 80000

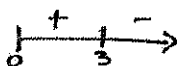
3) $s = -16t^2 + 96t + 112$

a) $v = -32t + 96$

$v(0) = 96 \text{ ft/sec}$

b) $v = -32t + 96 = 0$

$t = 3 \text{ sec}$



$s(3) = 256 \text{ ft.}$

c) $-16t^2 + 96t + 112 = 0$

$t^2 - 6t - 7 = 0$

$(t - 7)(t + 1) = 0$

$t = 7$

$v(7) = -128 \text{ ft/sec}$

4) $A = 8r^2 + 2\pi rh$

$V = 1000 \text{ cm}^3$

$V = \pi r^2 h = 1000$

$\pi r^2 h = 1000$

$h = \frac{1000}{\pi r^2}$

$A = 8r^2 + 2\pi r \left(\frac{1000}{\pi r^2} \right)$

$A = 8r^2 + \frac{2000}{r}$

$A = 8r^2 + 2000r^{-1}$

$h = \frac{1000}{\pi(25)} = \frac{40}{\pi}$

$A' = 16r - 2000r^{-2}$

$16r - \frac{2000}{r^2} = 0$

$16r^3 - 2000 = 0$

$r = 5$

$h:r = \frac{40}{\pi} : 5$

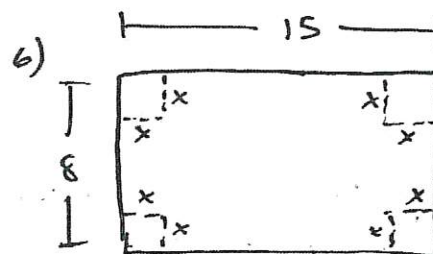
$= \boxed{\frac{8}{\pi} : 1}$

$$\begin{aligned}
 5) \quad A &= 16 \text{ m}^2 & P &= 2l + 2w \\
 l \cdot w &= 16 & P &= 2l + 2\left(\frac{16}{l}\right) \\
 w &= \frac{16}{l} & P &= 2l + 32l^{-1} \\
 P' &= 2 - 32l^{-2} = 0
 \end{aligned}$$

$$-\frac{32}{l^2} = -2$$

$$-32 = -2l^2$$

$$\boxed{
 \begin{aligned}
 l &= 4 \\
 w &= 4
 \end{aligned}
 }$$



$$V = x(8-2x)(15-2x)$$

$$V = 120x - 46x^2 + 4x^3$$

$$V' = 120 - 92x + 12x^2$$

$$V' = 30 - 23x + 3x^2$$

$$= 3x^2 - 23x + 30 = 0$$

$$(3x-5)(x-6) = 0$$

$$x = \frac{5}{3} \quad x = 6$$

$$\text{Dimensions: } \frac{14}{3} \times \frac{35}{3} \times \frac{5}{3}$$

7) F

8) D

9) G

10) C