

$$\#61) \quad H = -16T^2 + 48T + 32$$

MAX HT OCCURS AT VERTEX

$$T = \frac{-B}{2A} = \frac{-48}{2(-16)} = 1.5 \text{ sec}$$

$$H = -16(1.5)^2 + 48(1.5) + 32 = 68 \text{ feet}$$

(a) HT of BUILDING = 32 feet

(b) HITS GROUND WHEN  $H = 0$

$$0 = -16T^2 + 48T + 32$$

$$0 = T^2 - 3T + 2$$

USE QUADRATIC FORMULA

$$T = 3.56 \text{ sec}$$

$$(c) \begin{array}{r|l} T & H \\ \hline 2 & 64 \\ \hline 3.5 & 4 \end{array}$$

AVR VELOCITY

$$\frac{4 - 64}{3.5 - 2} = \frac{-60}{1.5} = -40 \text{ ft/sec}$$

(d)

T	H
2	64

$$2+L \quad | \quad -16(2+L)^2 + 48(2+L) + 32$$

$$-16(4+4L+L^2) + 96 + 48L + 32$$

$$-64 - 64L - 16L^2 + 96 + 48L + 32$$

$$-16L^2 - 16L + 64$$

AVR VEL

$$\frac{(-16L^2 - 16L + 64) - (64)}{(2+L) - 2}$$

$$(2+L) - 2$$

$$\frac{-16L^2 - 16L}{L} = \frac{-16L(L+1)}{L}$$

$$= -16(L+1) \rightarrow -16 \text{ ft/sec}$$

As  $L \rightarrow 0$

(OR)

USING SHORTCUT

$$H = -16T^2 + 48T + 32$$

$$V = -32T + 48$$

THEN AT  $T=2$ ,

$$V = -32(2) + 48 = -16 \text{ ft/sec}$$