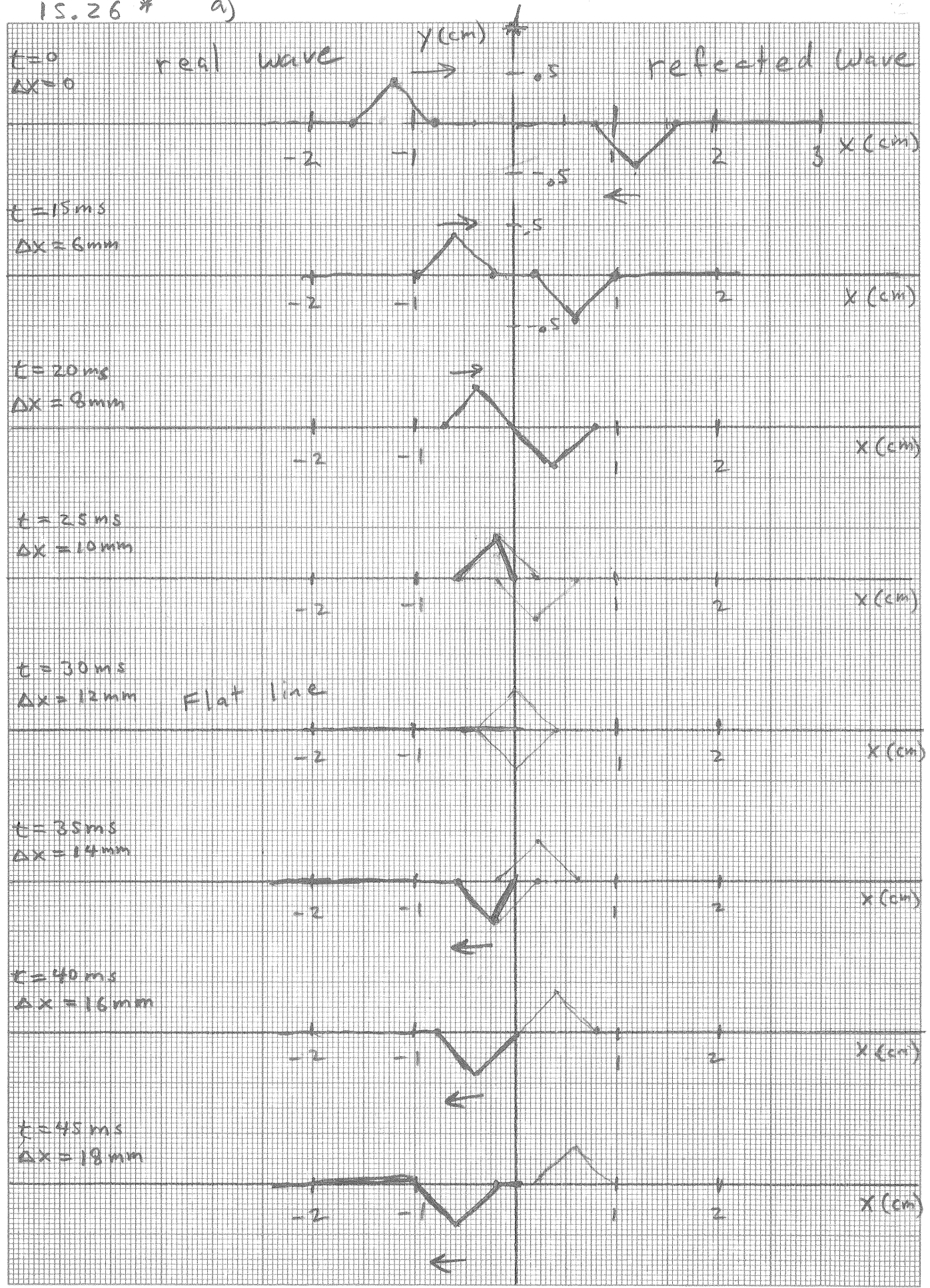
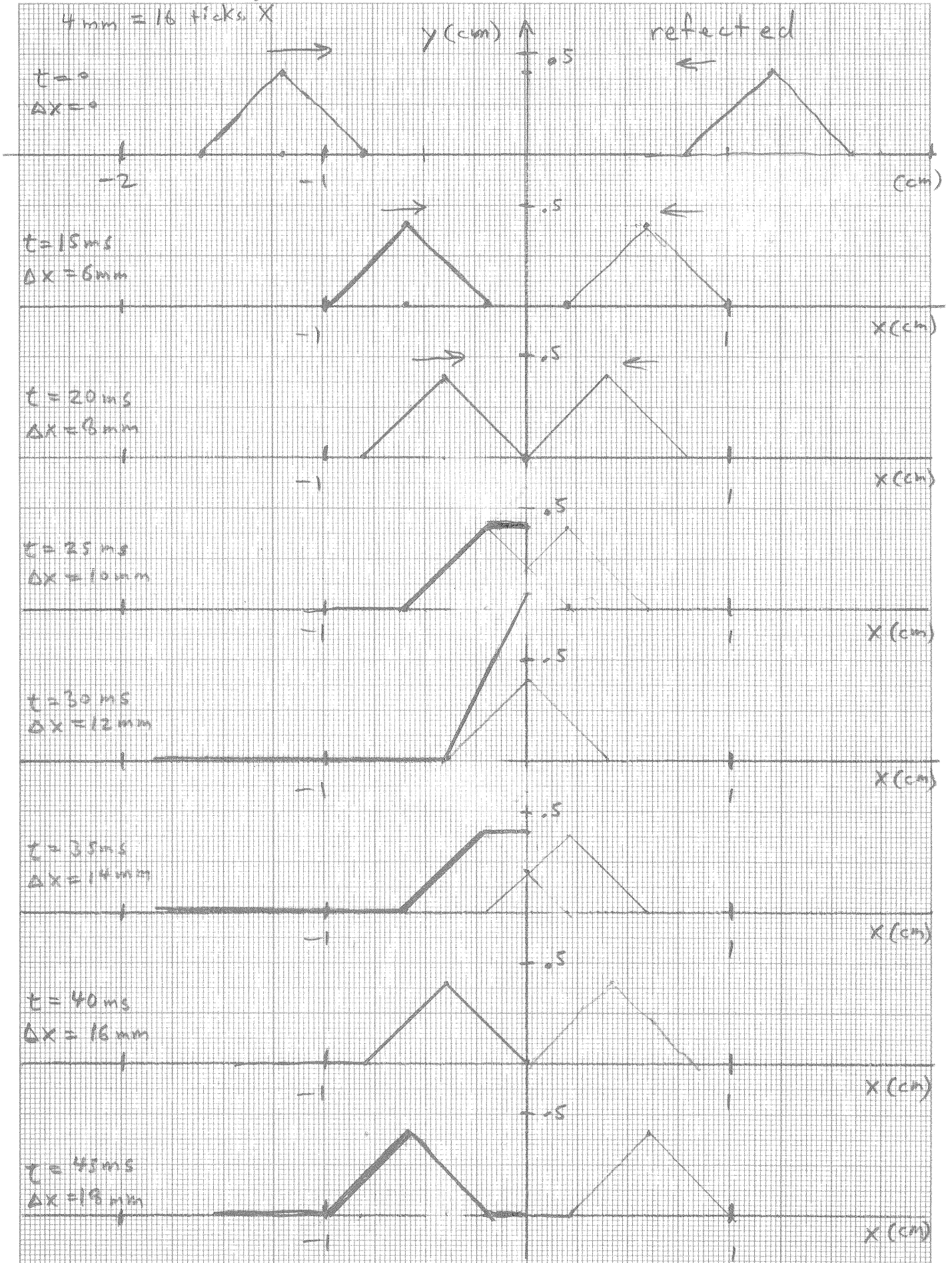


15.26 \* a)



15.26 b)

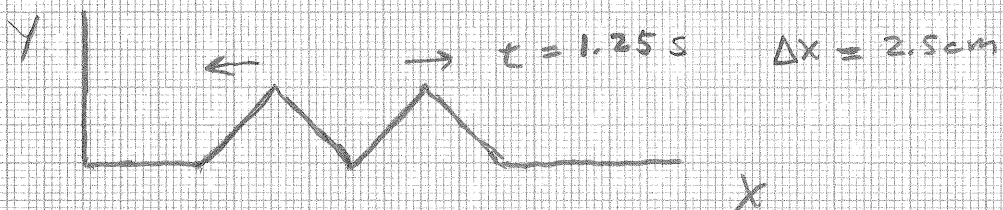
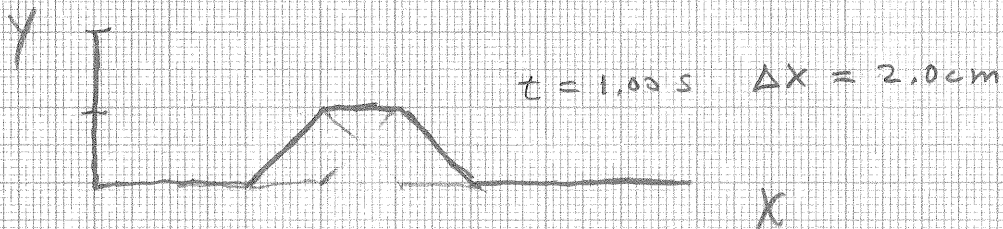
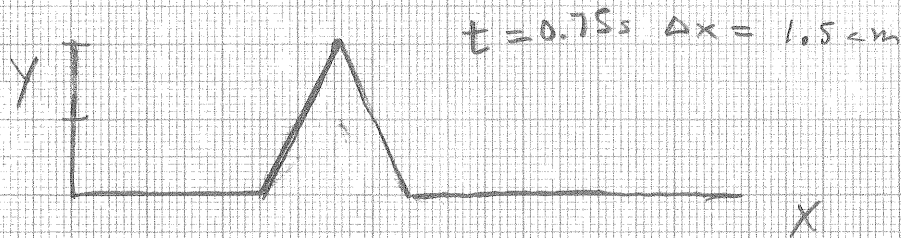
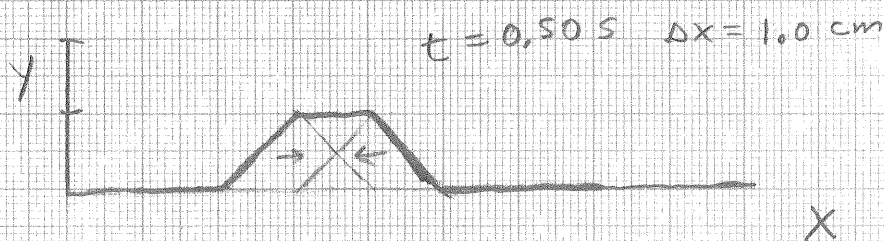
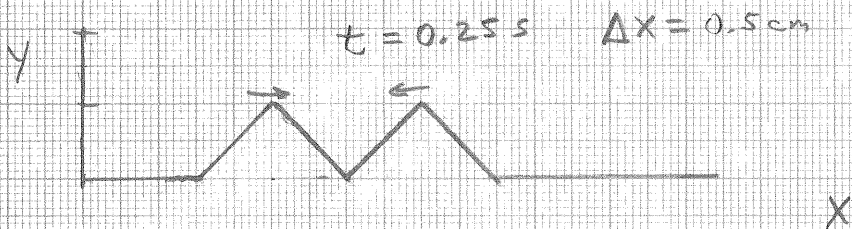
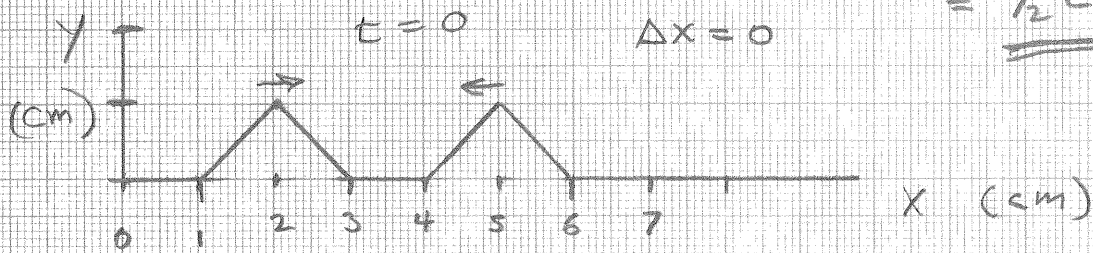
4 mm = 16 ticks, X



15.28 \*

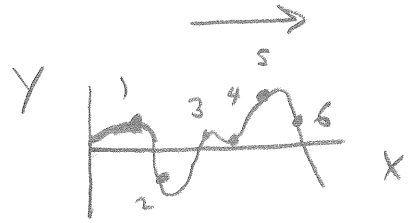
moves  $v \Delta t = \frac{2 \text{ cm}}{5} (0.25 \text{ s})$

$= \frac{1}{2} \text{ cm per frame}$



15.55 \*

$$v_y = \frac{\partial y}{\partial t} = -v \frac{\partial y}{\partial x}$$



a)

point #	direction of $v_y$	
	Right	Left
1	0	0
2	+	-
3	-	+
4	0	0
5	-	+
6	+	-

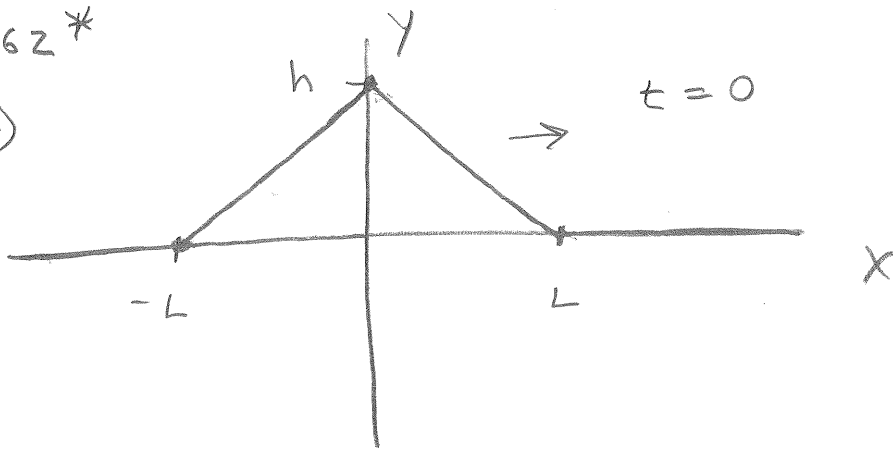
b)

$$a_y = \frac{\partial^2 y}{\partial t^2} = v^2 \frac{\partial^2 y}{\partial x^2}$$

point	Right	left
	$a_y$	$a_y$
1	-	-
2	+	+
3	-	-
4	+	+
5	-	-
6	0	0

15.62\*

a)



b)

$$y(x,t) = y(x-vt, 0)$$

$$= \begin{cases} 0 & \text{if } x-vt < -L \\ h(L+x-vt)/L & \text{if } -L < x-vt < 0 \\ h(L-x+vt)/L & \text{if } 0 < x-vt < L \\ 0 & \text{if } x-vt > L \end{cases}$$

c)

$$P(x,t) = F_y v_y = -F \frac{\partial y}{\partial x} \frac{\partial y}{\partial t}$$

$$= \begin{cases} 0 & \text{if } x-vt < -L \\ -F \left[ \frac{h}{L} \right] \left[ \frac{h}{L} (-v) \right] = Fv \left( \frac{h}{L} \right)^2 & \text{if } -L < x-vt < 0 \\ -F \left[ -\frac{h}{L} \right] \left[ \frac{h}{L} (v) \right] = Fv \left( \frac{h}{L} \right)^2 & \text{if } 0 < x-vt < L \\ 0 & \text{if } x-vt > L \end{cases}$$

$$\Rightarrow P(x,t) = \begin{cases} 0 & \text{if } x-vt < -L \\ Fv \left( \frac{h}{L} \right)^2 & \text{if } -L < x-vt < L \\ 0 & \text{if } x-vt > L \end{cases}$$