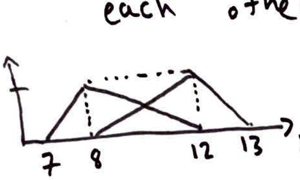
Reading 1/16 Solutions

(1) (a) Note in Eq. (16.66) there is no way for $f_+ = 3f_0$ if $V_0 < V$. Therefore Eq. (16.65) is the relevant one, and $\boxed{\text{the source is moving towards the reciever}}$

(b) $f_+ = 3f_0 = \dfrac{f_0}{1 - \frac{V_s}{V}} \Rightarrow \boxed{V_s = \frac{2}{3} V}$

(c) Eq. (16.63) $\Rightarrow \lambda_+ = (V - V_s)T = \left(\frac{1}{3}V\right)\frac{1}{f_0} = \boxed{\dfrac{V}{3f_0}}$ same as wavelength seen by observer

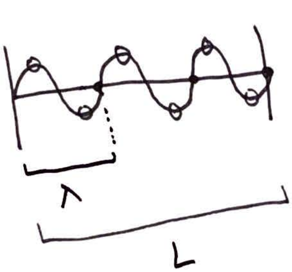
(2) @ t = 6 s the two waves would be on top of each other like this (see left)



Between 8 and 12 m, the two waves constructively interfere (think adding up two right triangles to make a rectangle)

Answer is $\boxed{C}$

(3) Yes



$\lambda = L/3$. For a standing wave on a string, the mode m is equal to the number of antinodes

$\boxed{m = 6}$