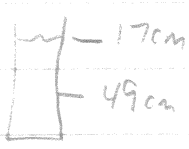
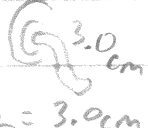




Phy C 15.2 # 40, 41, 43, 48, 50

40)  Obtain resonance is $\frac{1}{2} \lambda$
 $v = \lambda f$ $f = \frac{v}{\lambda} = \frac{343 \text{ m/s}}{1.2 \times 32 \text{ m}} = 535.9 \text{ Hz} = 540 \text{ Hz}$

41)  $L = 3.0 \text{ cm}$
 $f = \frac{v}{\lambda} = \frac{343 \text{ m/s}}{4(1.030 \text{ m})} = 2858 \text{ Hz} = 2900 \text{ Hz}$

43)  $f_1 = 16.4 \text{ Hz}$ $v = f \lambda$ $\lambda = \frac{v}{f} = \frac{343 \text{ m/s}}{16.4 \text{ Hz}} = 20.91 \text{ m}$
 $v = 343 \text{ m/s}$ Open Pipe: $2L$ So Pipe: $\frac{20.91 \text{ m}}{2}$

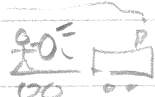
B) $f = \frac{v}{\lambda} = \frac{343 \text{ m/s}}{4(10.5 \text{ m})} = 8.17 \text{ Hz}$ $= 10.5 \text{ m Pipe}$

48)  $L = 2.40 \text{ m}$ A) $f = \frac{v}{\lambda} = \frac{343 \text{ m/s}}{4(2.40 \text{ m})} = 35.7 \text{ Hz}$

B) New $f = 35.7 \text{ Hz} - 1.40 \text{ Hz} = 34.3 \text{ Hz}$

$\lambda = \frac{v}{f} = \frac{343 \text{ m/s}}{34.3 \text{ Hz}} = 10 \text{ m} = \frac{2.50 \text{ m}}{4}$ closed tube.

$2.50 - 2.40 = 0.10 \text{ m}$

50)  $f = 440 \text{ Hz}$

$v = ?$

$f_B = 3 \text{ Hz}$



$f = 440 \text{ Hz}$

$f_d = f_s \left(\frac{v + v_d}{v - v_s} \right) = f_s \left(\frac{v}{v - v_s} \right)$

$(v - v_d) = 343 \text{ m/s}$

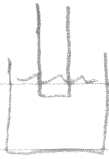
$\frac{f_d}{f_s v} = \frac{f_s v}{f_d} = v - v_s$ $(f_s v) - v = -v_s$

$v_s = - \left(\frac{f_s v}{f_d} \right) - v$

$= - \left(\frac{(440 \text{ Hz})(343 \text{ m/s})}{443 \text{ m/s}} \right) = 2.323 \text{ m/s} = 2.3 \text{ m/s}$

$$L = .22\text{m} - .03\text{m}$$

8)



$$L = .19 \quad \lambda = 4L$$

$$f = \frac{v}{\lambda} \quad v = \lambda f$$

$$= \frac{343\text{m/s}}{4(.19\text{m})}$$

$$= 451\text{Hz}$$

$$= 450\text{Hz}$$

9)



$$L = .22\text{m} \quad \lambda = 2L = .44\text{m}$$

$$f = \frac{v}{\lambda} = \frac{343\text{m/s}}{.44\text{m}} = 780.\text{Hz}$$



$$f = 780.\text{Hz}$$

$$v = 343\text{m/s}$$

$$\lambda = \frac{4L}{3}$$

$$\lambda = \frac{v}{f}$$

$$L = \frac{343\text{m/s}}{780.\text{Hz}} = 780\text{Hz}$$

$$\lambda = 1.336 = \frac{343\text{m/s}}{780.\text{Hz}} = L = 1.33\text{m}$$