P16.45

GENERIC

$v = f\lambda$

STRING

$v = \sqrt{\frac{F^T}{\mu}}$

$f\lambda = \sqrt{\frac{F^T}{\mu}}$

w/ μ = const

λ = const

$f \propto \sqrt{F^T}$

IF $F^T \uparrow$

THEN $f \uparrow$

BEATS

$f_B = |f_1 - f_2|$

$3\ Hz = |200 - f_2|$

$f_2 = 200\ Hz \pm 3\ Hz$

$f_2 = 200\ Hz + 3\ Hz$

$f_2 = 203\ Hz$

16.47

OPEN-OPEN

SYMMETRIC

$f_n = \frac{nv}{2L}$

w/ n = const

v = const

$f_n \propto \frac{1}{L}$

IF $L \uparrow$

THEN $f \downarrow$

$f_B = |f_1 - f_2|$

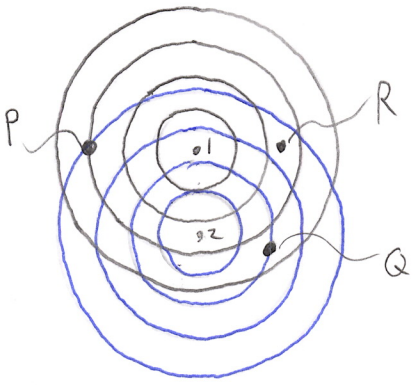
$4\ Hz = |f_1 - 523|$

$f_1 = 523 \pm 4$

$f_1 = 523 + 4$

$f_1 = 527\ Hz$

P16.40



	PL_1	PL_2	PLD ($\lvert PL_1 - PL_2 \rvert$)	Interference (Both in phase)
P	3λ	4λ	λ	Const.
Q	3.5λ	2λ	1.5λ	Dest.
R	2.5λ	3.5λ	λ	Const.

P16.36

PLD = DEST ↘ BOTH IN PHASE

PLD = $(m+\frac{1}{2})\lambda$

$V = f\lambda$

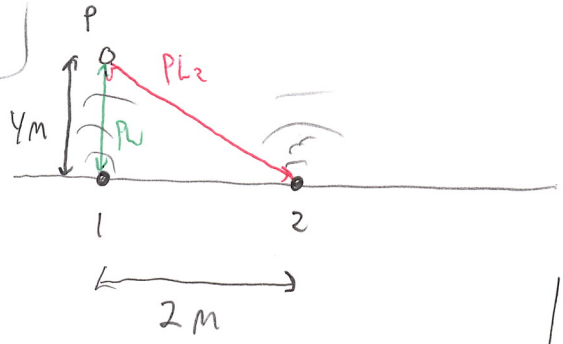
PLD = $(m+\frac{1}{2})\frac{1}{2}m$

$\frac{343}{686} = \lambda$

$\lambda = \frac{1}{2}m$

m	PLD
0	$\frac{1}{4}m$
1	$\frac{3}{4}m$
2	$\frac{5}{4}m$

P16.41



PLD $\overset{?}{=}$ CONS OR DEST (IN PHASE)

$|PL_1 - PL_2| \overset{?}{=}$ CORD

$\left|4 - \left(\sqrt{4^2+2^2}\right)\right| \overset{?}{=}$ CORD

$|4 - 4.472135955| \overset{?}{=}$ CORD

$0.472135955 \text{ METERS} \overset{?}{=}$ CORD

$V = f\lambda$

$\frac{340}{1800} = \lambda$

$\lambda = 0.1888\overline{8}$ METERS

IF CONST

$PLD = m\lambda$

$\frac{PLD}{\lambda} \overset{?}{=}$ INTEGER

IF DEST

$PLD = (m+\frac{1}{2})\lambda$

$\frac{PLD}{\lambda} \overset{?}{=} \frac{1}{2}$ INTEGER

$\frac{0.472135955}{0.1\overline{88}} = 2.5$

SO DESTRUCTIVE