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Wave Phenom #1

p 884 Concept 9

~~problem 58~~

Online ① Construct + Destruct Int

② Interference 2 Radio

p 884 - Concept

(3)

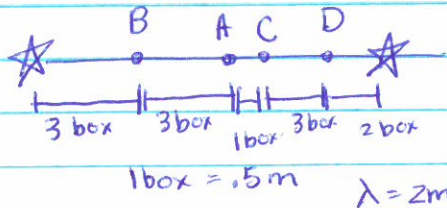
9) Describe double slit interference for sound

Use two speakers separated by ~~at~~ about 1m & connected to the same 1500 Hz oscillator. The speakers will emit sound waves that are in phase & so serve the same purpose as 2 slits through which single wave passes.

(1) Walk along a line in front of the speakers that is // to line ~~and~~ joining speakers, w/ ear about height of speakers. The line along which you walk should be about 1m in front of line joining the speakers. Cover the ear facing away from speakers. You should hear loud & quiet regions as you progress along line, which corresponds to the bright & dark regions of light observed in optical double slit experiment.

- Online

① Constructive + Destructive Int. Concept



Two source, coherent
in phase grid = 0.5m
 $\lambda = 2.0\text{m}$

A) Interference at A?

constructive (3m from both - in phase)

(1)

B) Interference at B?

destructive (4.5m, 1.5m away \rightarrow
not whole λ ,
not same value)

c) Interference at C?

destructive (3.5m, 2.5m away \rightarrow
not whole λ or
same value)

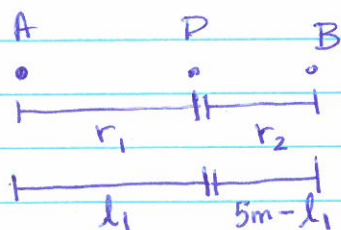
d) Interference at D?

Constructive (5.0m, 1m)
4m separate
2 whole λ apart

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② Interference of 2 Radiowaves

Two coherent radio sources A+B 5m apart
 $\lambda = 6\text{m}$



A) distance from A
constructive

$$\Delta l = m\lambda$$

$$l_1 - l_2 = m\lambda$$

$$l - (5\text{m} - l_1) = (0)(6\text{m})$$

$$l - 5 + l = 0$$

$$2l = 5$$

$$l = 2.5\text{m}$$

B) distance 3 from A destructive

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

$$l_1 - l_2 = (m + \frac{1}{2})\lambda$$

$$l - (5\text{m} - l) = \frac{1}{2}(6)$$

$$l - 5 + l = 3$$

$$2l = 8$$

$$l = 4$$



4m from A, also 4m from B

$l = 1\text{m}$
 from A