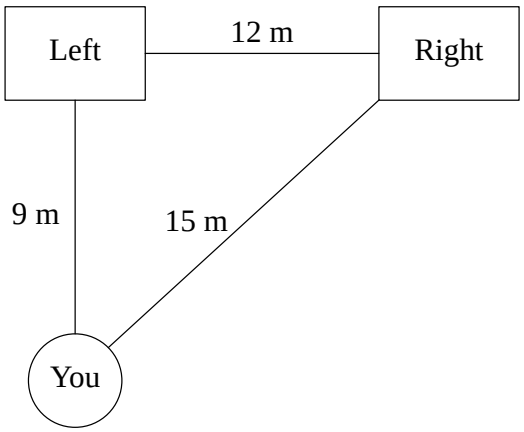
4. (30 pts.) Two speakers are separated by a distance of 12 m. You are standing 9 m in front of the left speaker such that the two speakers and you form a right triangle. Assume that the sound from the two speakers has the same amplitude, and that the speed of sound in air is 344 m/s.

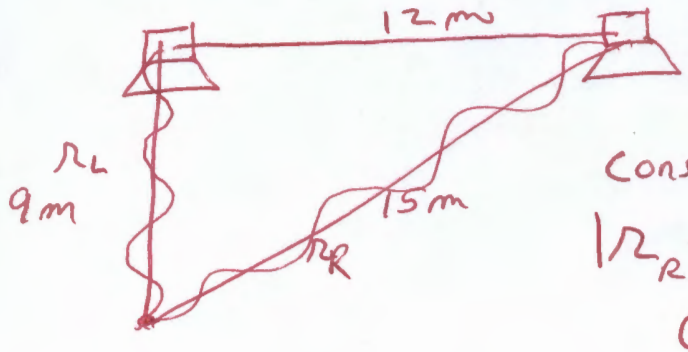
a. (15 pts.) Find the lowest frequency such that you hear **constructive** interference.



b. (15 pts.) Find the lowest frequency such that you hear **destructive** interference.

4. (30 pts.) Two speakers are separated by a distance of 12 m. You are standing 9 m in front of the left speaker such that the two speakers and you form a right triangle. Assume that the sound from the two speakers has the same amplitude, and that the speed of sound in air is 344 m/s.

a. (15 pts.) Find the lowest frequency such that you hear constructive interference.



Constructive:

$|R_R - R_L| = 1\lambda$

$6m = \lambda$

but

$f = v/\lambda = \frac{344\ m/s}{6\ m} = \boxed{57.3\ Hz}$

b. (15 pts.) Find the lowest frequency such that you hear destructive interference.

Destructive

$|R_R - R_L| = \frac{1}{2}\lambda$

$6m = \frac{1}{2}\lambda$

$12m = \lambda$

$f = \frac{v}{\lambda} = \frac{344}{12} = \boxed{28.7\ Hz}$