

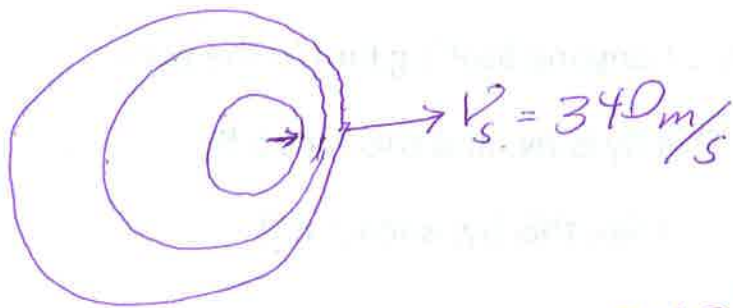
Doppler problem

I hear 300 Hz + I am stationary, so I know the sound is approaching me at $V = 340 \text{ m/s}$, so $V = \lambda f$ or

$$\lambda = \frac{V}{f} = \frac{340 \text{ m/s}}{300 \text{ /s}} = 1.13 \text{ m}$$

The F15 is making waves in front of it 1.13 m long. I know its frequency is 100/s

$V = \lambda f = 1.13 \text{ m} \cdot 100 \text{ /s} = 113 \text{ m/s}$ This is how fast the waves move away from the F15, but the speed of sound is 340 m/s!



$$\underline{V_s - V_{F15} = 113 \text{ m/s}}$$

$$\underline{V_{F15} = 340 \text{ m/s} - 113 \text{ m/s} = 227 \text{ m/s}}$$

$\sim 500 \text{ mi/hr}$

↑
speed that wave leaves F15

e) if I know that $\lambda = 1.13 \text{ m}$ + my friend hears $f = 200 \text{ Hz}$, how fast must the waves be moving with respect to her? I know she's moving ~~at the~~ away from the source because she hears a lower f than I do.