

This is an addendum to the Doppler Shift problem.

We know that my friend must be moving away from the source because she hears a lower frequency than I do (I'm stationary). However, she must be going slower than the source is moving because if she were going the same speed as the source, she would hear the same frequency as the source was making (please prove this to yourself with a drawing). How do we find her exact speed? We know that she hears a frequency of 200 Hz from a sound with a wavelength of 1.13 m. This means that the waves must be approaching her at a speed of 226 m/s. If the speed of sound (approaching her) is 340 m/s, this means she must be moving away from the source at a speed of 114 m/s. Please make a drawing. I hope this helps.

Pete