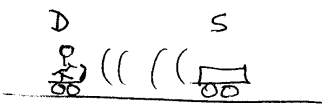


Physics 102Rec
Quiz#2
Chapter 18

Name: Key Id: _____ Sect: _____

An ambulance with a siren emitting sound at 1.5 kHz overtakes and passes a cyclist pedaling a bike at 36 km/h. After being passed, the cyclist hears a frequency of 1.2 kHz. How fast is the ambulance moving? Take speed of sound to be 340 m/s.

$$f = 1500 \text{ Hz} \quad f' = 1200 \text{ Hz}$$

$$v_D = 36 \text{ km/h} = 10 \text{ m/s}$$


$$f' = f \frac{v + v_D}{v + v_s} = 1500 \left(\frac{340 + 10}{340 + v_s} \right) = 1200$$

$$\frac{350}{340 + v_s} = \frac{12}{15} = 0.8$$

$$\Rightarrow 350 = 0.8 * 340 + 0.8 v_s$$

$$\Rightarrow v_s = \frac{350 - 272}{0.8} = 97.5 \text{ m/s}$$