

v' is given by
$$v' = v \frac{|v|}{|v| + |v_s|}$$

Adopting $|v| = 340 \text{ m/s}$, $|v_s| = 15 \text{ m/s}$. $v = 800 \text{ Hz}$

$$v' = \frac{800 \cdot 340}{340 + 15} = 766 \text{ Hz}.$$

b). Whatever frequency is incident upon the cliff is reflected without change, therefore, the observer will receive the same frequency in the echo that another observer on the cliff would hear directly. The frequency v'' in the echo is therefore given by

$$v'' = v \frac{|v|}{|v| - |v_s|} = \frac{800 \cdot 340}{340 - 15} = 837 \text{ Hz}.$$

3. (a) The original frequency of the piano cord differed from the 440 Hz, and was therefore either 444 Hz or 436 Hz. To choose between these we note the reducing tension in the cord drops the frequency. since by decreasing tension the number of beats increased, she must have started with the A cord at lower frequency than the tuning fork and it got lower still. It therefore was at 436 Hz to start, and dropped to 435 Hz after the adjustment.