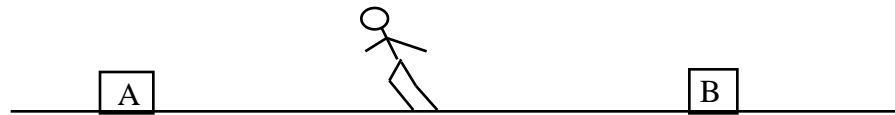# DOPPLER EFFECT   QUIZ 1.0

1. Two sound speakers, A and B, both sound a tone with a frequency of 480 Hz. A runner, between the two speakers, runs from B to A with a speed of 10 m/s.

      (a) Determine the observed frequency coming from A, f_{OA}.

   (b) Determine the observed frequency coming from B, f_{OB}.

2. A train moves at 30m/s toward Arnold and away from Ben. Both are sitting down by the railroad track. The train sounds a whistle with a pitch of $f_s = 500$Hz.

      (a) Find the frequency heard by Arnold, f_{OA}.

      (b) Find the frequency heard by Ben, f_{OB}.

3. Oscar's car is moving toward a cliff at 20m/s. His horn sounds a beep of 450 Hz. Oliver is sitting atop the cliff.

      (a) What frequency note does Oliver hear?

      (b) What frequency echo does Oscar hear?
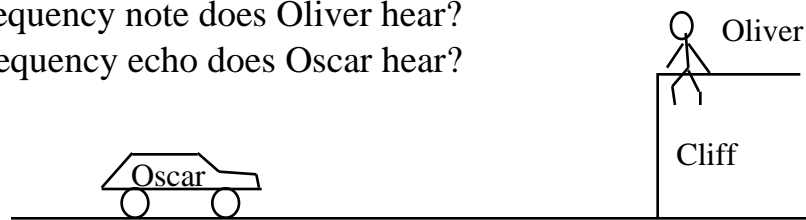
4. Two hot air balloons are being carried along by a 40m/s wind toward an observer, Charlie, sitting on the roof of a tall building. If balloon A sounds a note with $f_A = 300$Hz, find

      (a) the frequency heard by Ben in balloon B, f_{OB}.

      (b) the frequency heard by Charlie on the roof, f_{OC}.