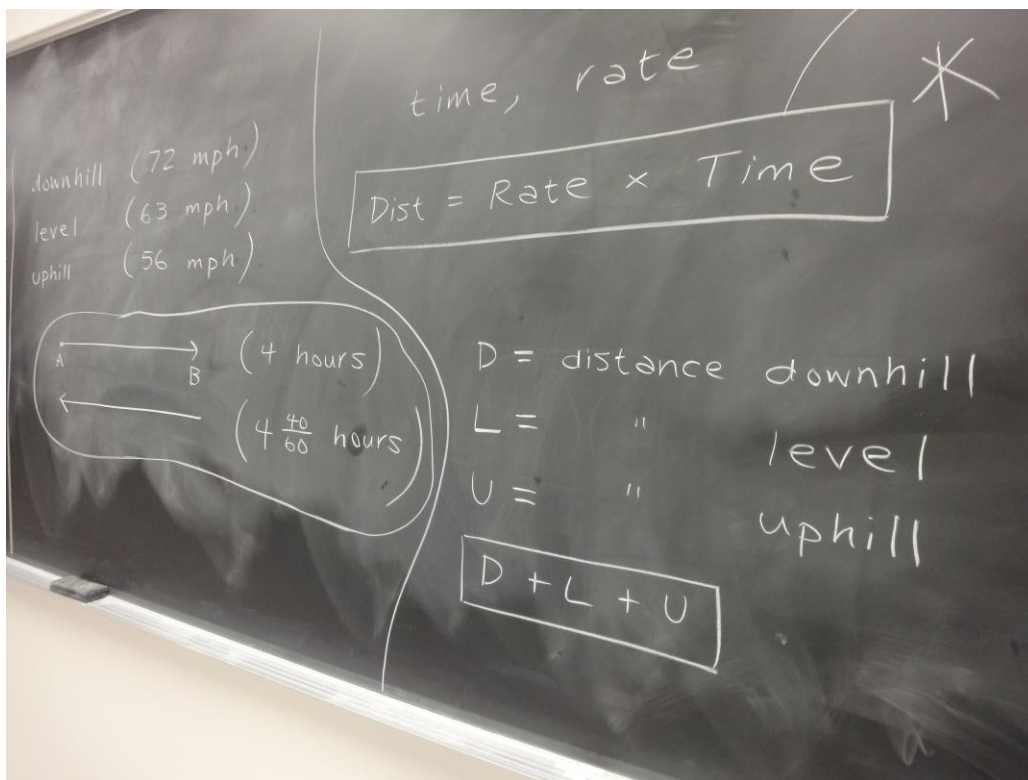


HOW FAR?

A car travels downhill at 72 mph, on level ground at 63 mph, and uphill at 56 mph. The car takes 4 hours to travel from town A to town B. The return trip takes 4 hours and 40 minutes.

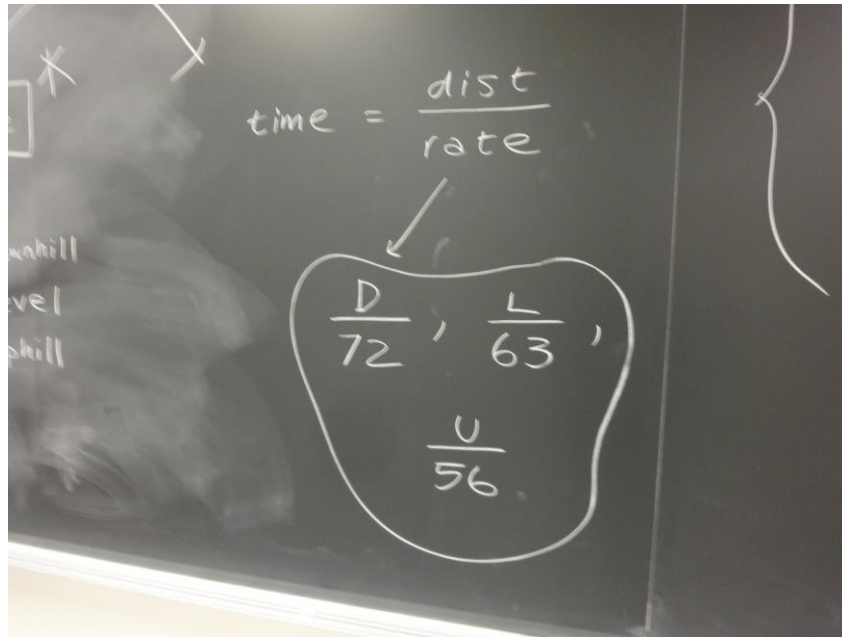
Find the distance between the two towns.

Here is what we know (direct from reading the problem):



Distance = Rate \times Time is also a big piece of this problem.

Now look at the sequence of boards below to see how you can solve this problem.



$$\left\{ \begin{array}{l} \frac{D}{72} + \frac{L}{63} + \frac{U}{56} = 4 \quad (A \rightarrow B) \\ \frac{U}{72} + \frac{L}{63} + \frac{D}{56} = 4\frac{2}{3} \quad (B \rightarrow A) \end{array} \right.$$

$$\begin{aligned} \left(\frac{D}{8 \cdot 9} + \frac{L}{7 \cdot 9} + \frac{U}{7 \cdot 8} = 4 \right) & \cdot 7 \cdot 8 \cdot 9 \\ \left(\frac{U}{8 \cdot 9} + \frac{L}{7 \cdot 9} + \frac{D}{7 \cdot 8} = 4\frac{2}{3} \right) & \cdot 7 \cdot 8 \cdot 9 \\ \hline 7D + 8L + 9U &= 4 \cdot 7 \cdot 8 \cdot 9 = 2016 \\ 7U + 8L + 9D &= 4\frac{2}{3} \cdot 7 \cdot 8 \cdot 9 = 2352 \end{aligned}$$

$$\begin{aligned} 7D + 8L + 9U &= 2016 \\ + \quad 7U + 8L + 9D &= 2352 \\ \hline 16U + 16L + 16D &= 4368 \\ 16(U + L + D) &= 4368 \\ U + L + D &= \frac{4368}{16} \\ &= 273 \text{ miles} \end{aligned}$$