Hw 2 #8

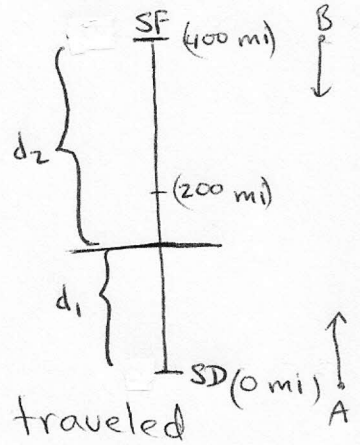
d_1 = distance A covers before B starts (at 2:00pm)

d_2 = distance between A and B when B starts

so we know $d_1 + d_2 = 400$ miles

r_A = rate of A = 60 mph

r_B = rate of B = 80 mph



(1) Car A started at noon, so by 2:00, it has traveled $t = 2$ hours, and so

$$d_1 = r_A \cdot t = 60 \cdot (2) = 120 \text{ miles}$$

(2) $d_1 + d_2 = 400$ so $d_2 = 400 - d_1$

$-d_1 \quad -d_1 \rightarrow$ $= 400 - 120$

$= 280$ miles = distance btw A & B at 2pm

(3) How long does it take A & B to meet?

(i.e., How long does it take A and B to cover the 280 mi combined?)

$$d = r \cdot t \Rightarrow t = \frac{d_2}{r_A + r_B} = \frac{280}{60+80} = \frac{280}{140} = 2 \text{ hrs.}$$

(4) So B traveled for 2 hrs

or

$d = r_B t = 80 \cdot 2 = 160$ miles from SF before meeting A.