



Algebra Problem

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Problem: At 9am, car A began a journey from a point, traveling at 40 mph. At 10am another car, car B, started traveling from the same point as car A (in the same direction as car A) at 60 mph. At what time will car B pass car A?

Step 1: Walk through the problem, pick out and assign variables to the given values, and define the question that is being asked.

$$r_1 = 40 \text{ mph}$$

$$t_1 = 9\text{am} = t \text{ hours}$$

$$r_2 = 60 \text{ mph}$$

$$t_2 = 10\text{am} = t - 1 \text{ hours}$$

Q: At what time will car B pass car A?

Step 2: Interpret the problem by drawing a picture and determining what the question is “really” asking.

What is the question asking: at what time will the cars have travelled the same distance?

Step 3: Determine the appropriate equation for the problem and setup the equation based on the problem.

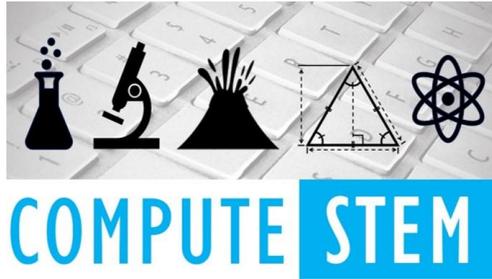
$d = \text{rate} * \text{time}$ → this equation relates the rate that the cars are traveling, the distance travelled, and the time travelled by each car.

$$\text{Equation for car 1: } d_1 = r_1 * t_1$$

$$\text{Equation for car 2: } d_2 = r_2 * t_2$$

Since we are solving for the time that the cars have travelled the same distance we set the distances equal to each other, the equation is as follows:

$$r_1 * t_1 = r_2 * t_2$$



Step 4: Plug in the values and solve for the unknown

$$\begin{aligned} \square_1 * \square_1 &= \square_2 * \square_2 \\ 40 * \square &= 60(\square - 1) \\ 40\square &= 60\square - 60 \\ 60 &= 20\square \\ 3 &= \square \end{aligned}$$

Step 5: Answer the question being asked.

The answer $t = 3$ hrs. represents the time it takes for the cars to travel the same distance, thus passing each other. The question asks at what time will the cars meet. Car A leaves at 9 am so the cars will meet at 9am + 3hrs. = 12pm.