Question #54934, Physics / Mechanics | Kinematics | Dynamics |

A car moving at 95 km/h meets a train of length 1.2 km moving at 40 km/h along a track parallel to the road. What distance does the car travel in passing the length of the train given that they travel
a) in the same direction
b) in opposite direction

I found the answer when they travel in the same direction wich gave me 2.07 km, but I tried in opposite direction and I can't seem to have the right answer.

Answer:

First of all you should find the time which needs to pass the train.

a) The speed of car relative to the train is:
V_1 = 95 km/h – 40 km/h = 55 km/h
Thus, it passes the train for the following time:
$t_1 = \frac{L}{V1} = \frac{1.2\ km}{55\ km/h}$ = 0.02182 h
The distance passed during this time equals: $L = t_1V_2$ = 0.02182 h × 95 km/h = 2.073 km, where
V_2 - the speed of car relative to the ground.

b) The speed of car relative to the train is:
V_3 = 95 km/h + 40 km/h = 135 km/h
Thus, it passes the train for the following time:
$t_2 = \frac{L}{V3} = \frac{1.2\ km}{135\ km/h}$ = 0.00889 h
The distance passed during this time equals: $L = t_2V_2$ = 0.00889 h × 95 km/h = 0.844 km