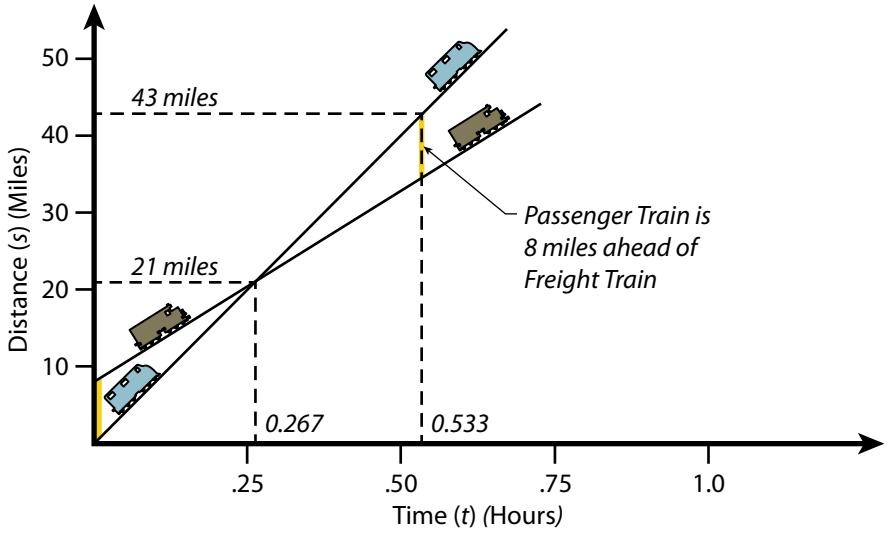
APPENDIX C

TRAIN OVERTAKE DISTANCE CALCULATIONS



Passenger Train Position (Distance): $\frac{ds_1}{dt} = 80\text{mph}$

Freight Train Position (Distance): $\frac{ds_2}{dt} = 50\text{mph}$

$s_1 = 80t$
$s_2 = 50t + 8$

Location where Passenger Train is even with the Freight Train ("neck-and-neck"):

$s_1 = s_2 \Rightarrow 80t = 50t + 8 \Rightarrow 30t = 8 \Rightarrow t = 0.267$ hrs

$80\ (0.267) = 21$ miles $= s_1 = s_2$

Location where Passenger Train is 8 miles ahead of the Freight Train:

$s_1 = s_2 \Rightarrow 80t - (50t + 8) = 8 \Rightarrow 30t = 16 \Rightarrow t = 0.533$ hrs

$80\ (0.533) = 43$ miles $= s_1$

$50\ (0.533) + 8 = 35$ miles $= s_2$