Special Relativity Solutions 4:
MINKOWSKIAN GEOMETRY I

Refer to the attached completed diagram on grid paper.

[easy] 4. $v_B = \dfrac{12m}{(40m-25m)/c} = \dfrac{4}{5}c$

[medium] 6.
$$\begin{aligned}(c\Delta t_B)^2 &= (c\Delta t_A)^2 - (\Delta x_A)^2 \\ &= (15m)^2 - (12m)^2 \\ &= 81m^2 \\ c\Delta t_B &= 9m\end{aligned}$$

$$\begin{aligned}c\Delta t_B &= \sqrt{1-\frac{v^2}{c^2}}\,c\Delta t_A \\ &= \sqrt{1-\left(\frac{4}{5}\right)^2}\,(15m) \\ &= 9m\end{aligned}$$

Now 16m + 9m = 25m

[easy] 9. 12m

[easy] 10. $12m \times \dfrac{5}{3} = 20m$