

24. Using the notation of Eq. 38-28 and taking “away” (from us) as the positive direction, the problem indicates $v = +0.4c$ and $u = +0.8c$ (with 3 significant figures understood). We solve for the velocity of Q_2 relative to Q_1 :

$$u' = \frac{u - v}{1 - uv/c^2} = \frac{0.8c - 0.4c}{1 - (0.8)(0.4)} = 0.588c$$

or $u' = 1.76 \times 10^8$ m/s in a direction away from Earth.