PHYS 615 – Activity 15.3: Relativistic Velocity Addition

1. *A rocket shooting bullets*

   A rocket traveling at speed $\frac{1}{2}c$ relative to frame S shoots forward bullets at speed $\frac{3}{4}c$ relative to the rocket. What is the speed of the bullets relative to frame S?

2. *A rocket shooting laser pulses*

   A rocket traveling at speed $\frac{1}{2}c$ relative to frame S shoots forward laser pulses at speed of light. What is the speed of the laser pulses relative to frame S?

3. *A rocket shooting perpendicular laser pulses*

   A rocket traveling at speed V in the x direction relative to frame S shoots laser pulses along the y' direction relative to its rest frame. What is the speed of the laser pulses relative to frame S?

4. *(bonus) A rocket shooting laser pulses at an angle*

   A rocket traveling at speed V in the x direction relative to frame S shoots laser pulses in the x'-y' plane in its rest frame, at an angle θ above the x' direction. What is the speed of the laser pulses relative to frame S?