

**PHY151H1F – Practice Problem Set 3**

Ch. 14, Q. 36

36. An elementary particle is launched from Earth toward the Regulus system, 77.5 light years distant. At what speed relative to Earth must this particle travel to make this trip in 10 y in the reference frame of the particle? ●

Ch. 14, Q. 42

42. Describe the shape of the Moon as measured by an observer in a reference frame traveling past the Moon at a relative speed of (a) 1000 m/s, (b)  $0.50c_0$ , and (c)  $0.95c_0$ . ●●

Ch. 14, Q. 75

75. Relative to Earth, spaceship A travels at  $0.732c_0$  away from Earth, and spaceship B travels at  $0.914c_0$  toward Earth along the same straight line. (a) How fast does A move according to an observer aboard B? (b) At  $t = 0$  the two ships are separated by  $4.5 \times 10^{10}$  m in the Earth reference frame. At what instant  $t$  do they pass each other according to an observer at rest on Earth? ●●