Two-Observer Spacetime Diagrams

Physics II: Modern Physics

College of the Atlantic

1. Anastajia is at rest and Beowulf is moving to the right at a speed of $\beta = 3/4$. Beowulf's origin ($x' = 0$) passes Ana's origin at $t = t' = 0$.

   (a) What is the value of γ?

   (b) The clock at the origin of Beowulf's frame reads 1s. What is the time reading of this event in Ana's frame?

   (c) The clock at the origin of Beowulf's frame reads 2s. What is the time reading of this event in Ana's frame?

   (d) Draw a quantitatively accurate spacetime diagram for this situation. Include the t' axis. Indicate $t' = 1$s and $t' = 2$s on the appropriate locations on the diagram.

2. The figure below shows a two-observer spacetime diagram.

   (a) What is the speed of the moving observer?

   (b) For each event (A,B,C), determine the coordinates in the unprimed and primed frames.