Title: Workshop on Ready-To-Use Teaching Resources on Modern Physics

Date: Jul 07, 2006 03:00 PM

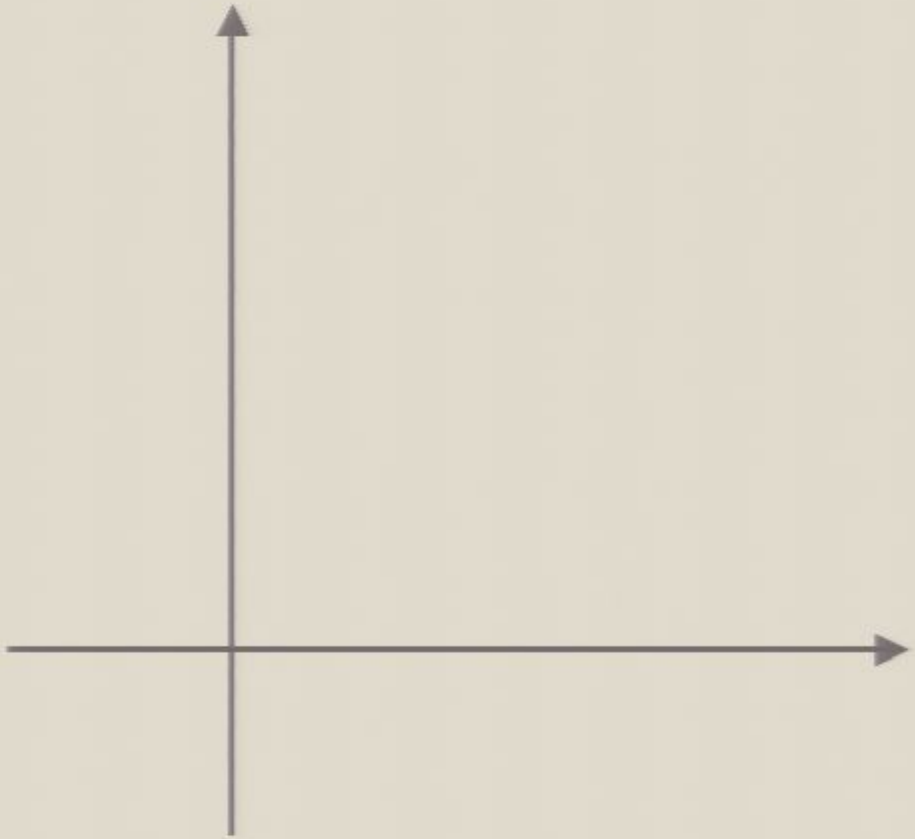
URL: http://pirsa.org/06070014

Abstract:

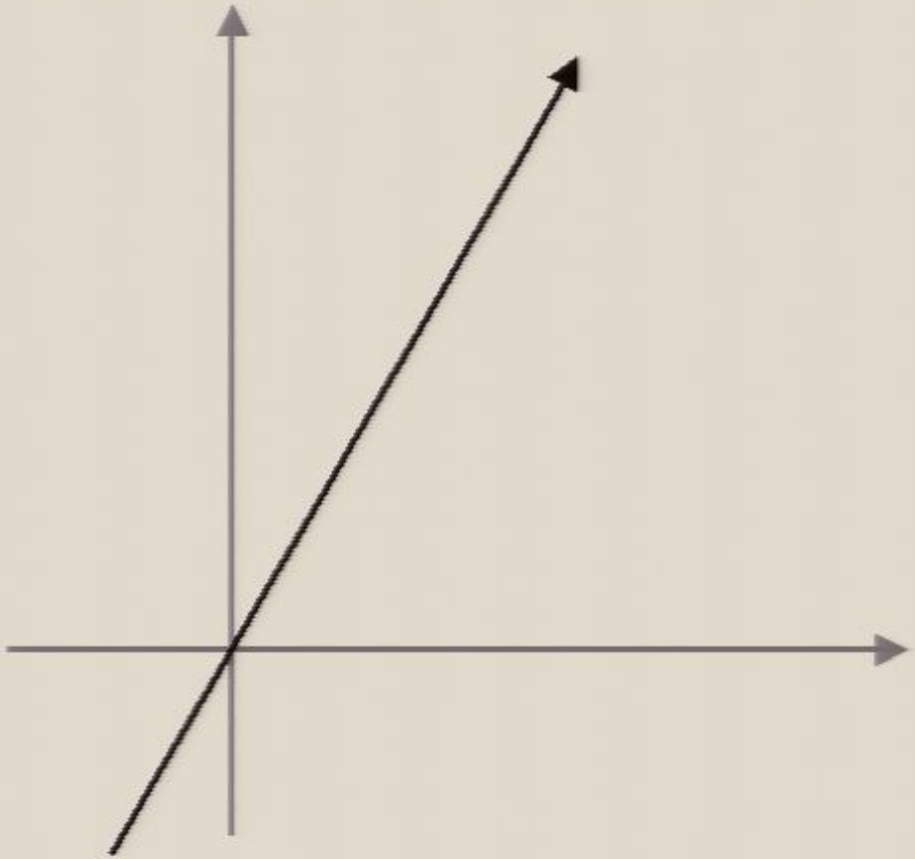
Spacetime Diagrams Seriously Simplified

Spacetime Diagrams Seriously Simplified

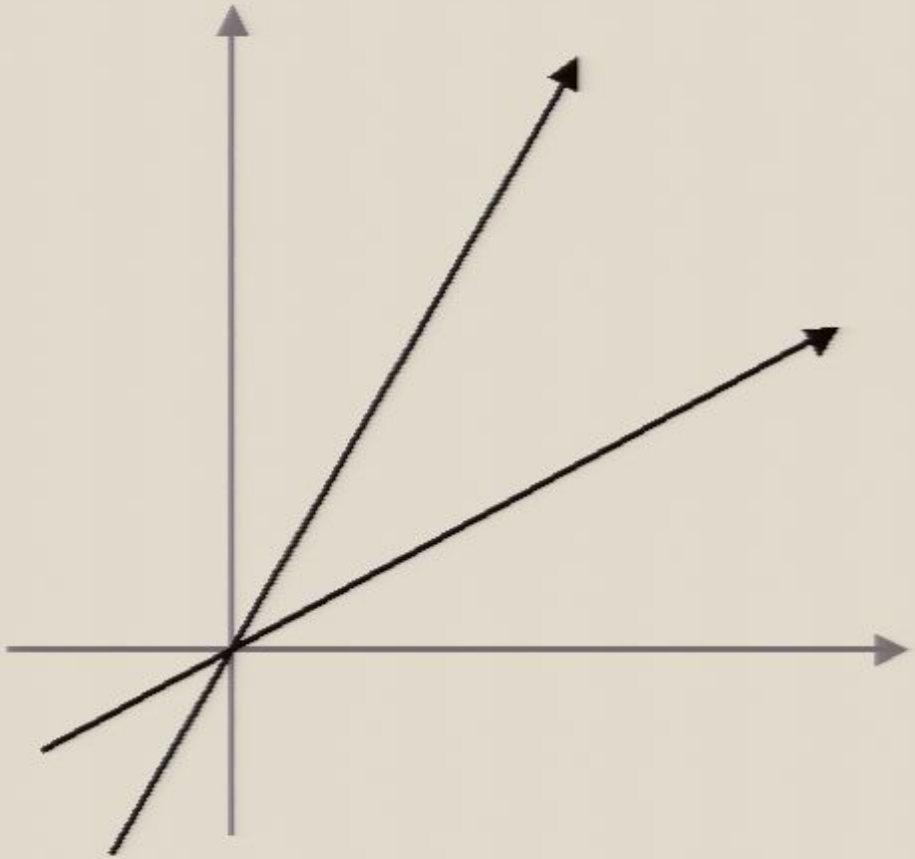
Establish a frame F with horizontal axis x and vertical axis ct so that light rays will appear at +/-45°.



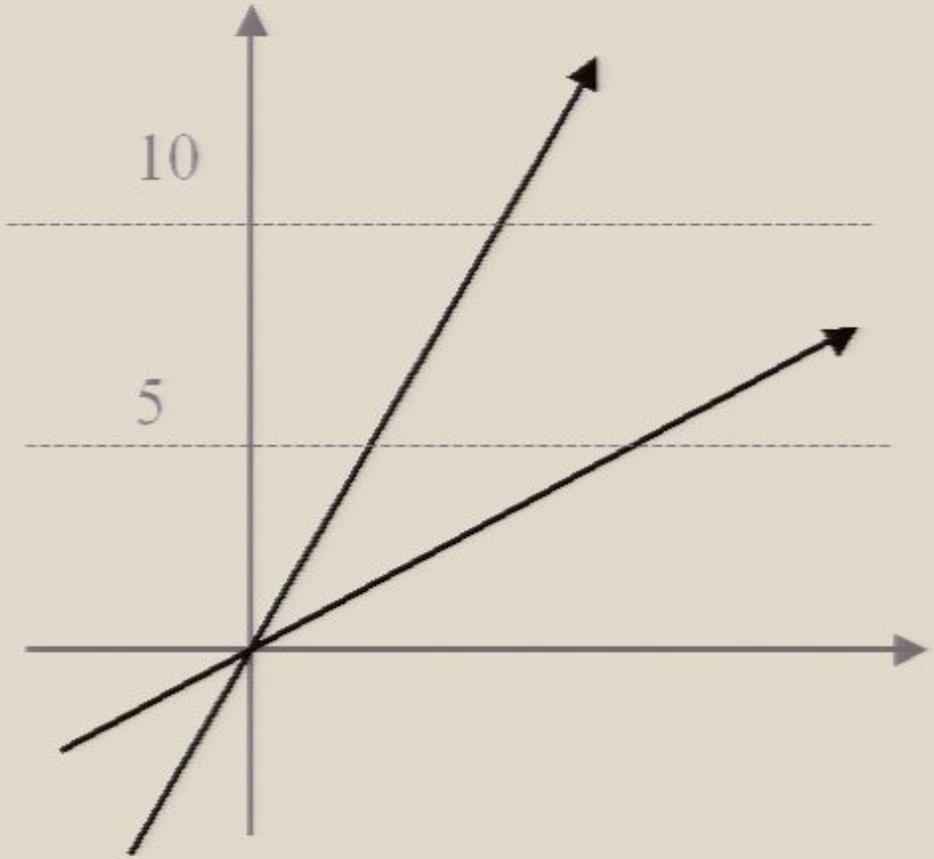
Add a worldline of something moving at 3/5 c relative to F. It has a slope of 5/3 in frame F and will form the t' axis of a frame F'.



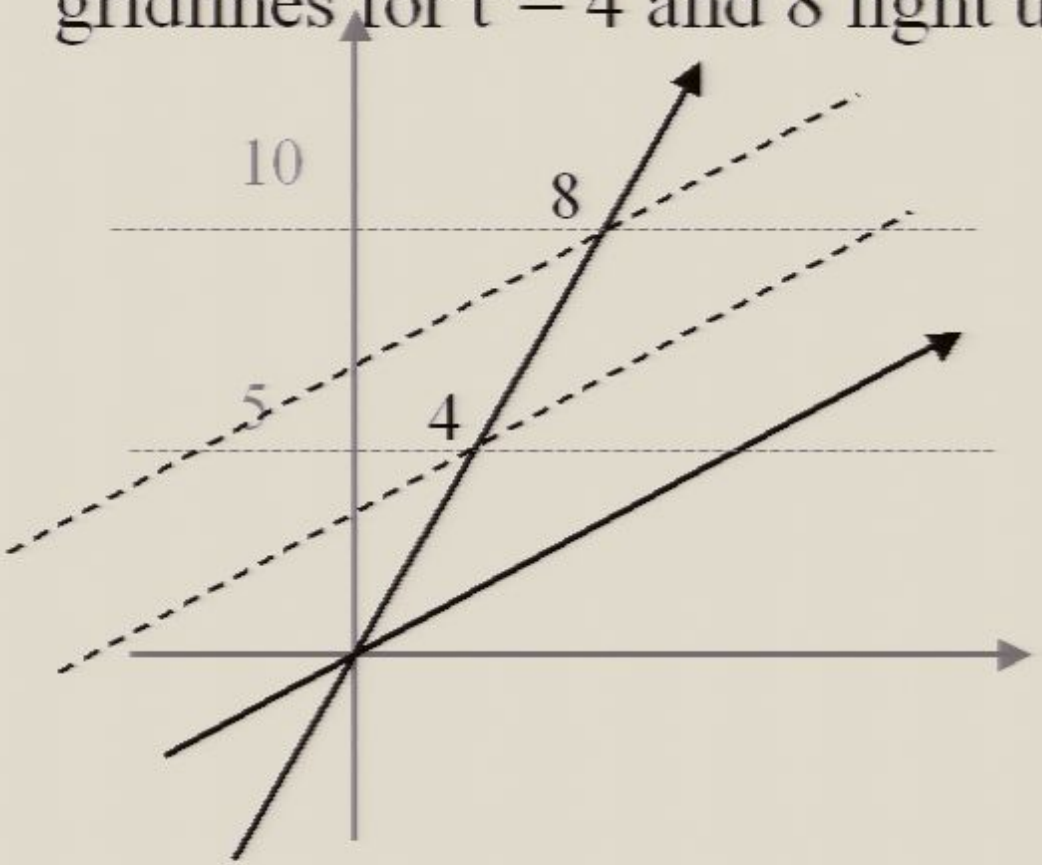
Add the x' axis. It will have a slope of 3/5 in frame F.



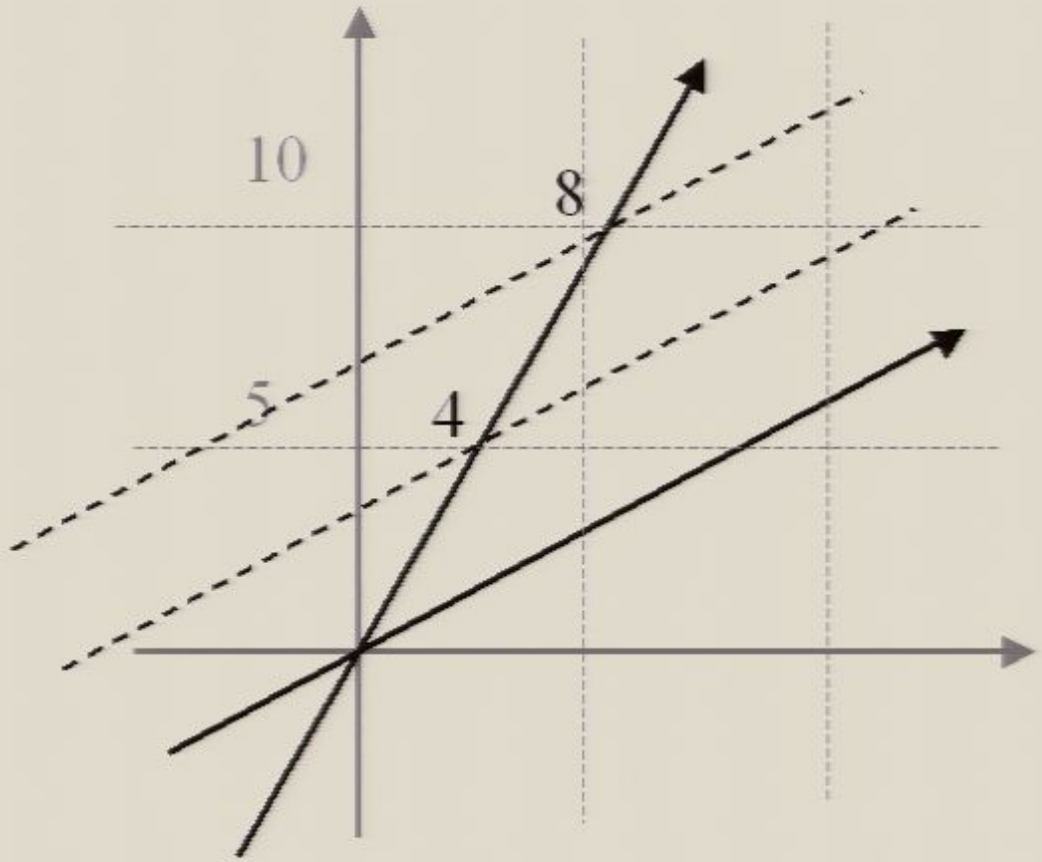
Add a gridline for x = 5 and 10 light units.



At a speed of 3/5 c, gamma is 5/4 which makes marking the t' axis really easy. Wherever the x gridlines meet the t' axis is marks t' = 4/5t. Draw t' gridlines for t'= 4 and 8 light units.

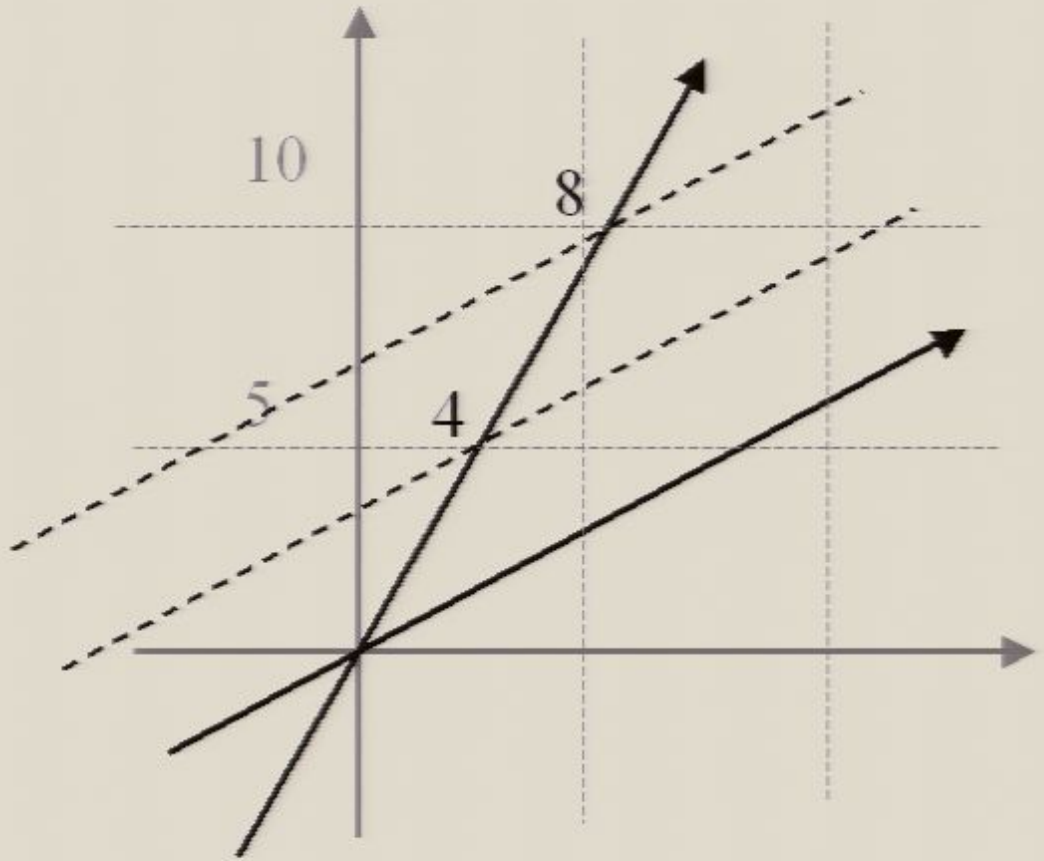


Draw x and x' grid lines in a similar fashion.



You now have a very powerful tool that allows you to visualize and quantify all sorts of problems in relativity: space contraction, the 'twin' paradox, addition of velocities, relativistic Doppler shift etc.

Draw x and x' grid lines in a similar fashion.



End of slide show, click to exit.