[lex144] Moving calendars

Two calendars named Jack and Jill measure proper dates t and t' (in units of years), respectively. They happen to move at constant relative velocity $v = 0.8c$ past each other. Their dates are synchronized when they meet: $t = t' = 0$. On her way out, Jill encounters a third calendar named Jane with proper date t'' moving at the same speed relative to Jack, but in opposite direction. Jill and Jane synchronize their dates at $t' = t'' = 3\text{y}$ when they meet.
(a) When Jane meets Jack, what date t does Jack show and what date t'' does Jane show?

On the first day of every year, each calender sends out a light signal with a characteristic signature. Jill stops sending/receiving signals and Jane starts sending/receiving signals when they meet.
(b) On what dates does Jill receive Jack's signals and does Jack receive Jill's signals?
(c) On what dates does Jane receive Jack's signals and does Jack receive Jane's signals?

Solution: