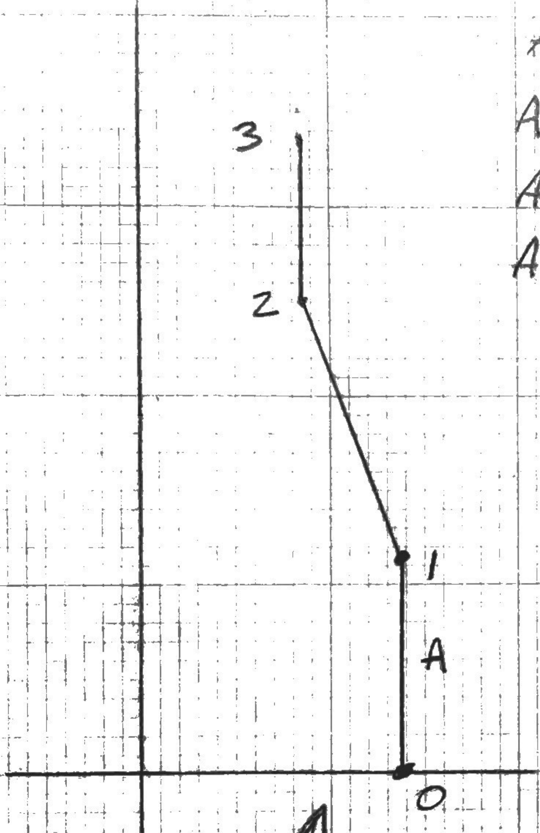
HW 9 5-2(a), 1-6, 2-3

5-2(a)

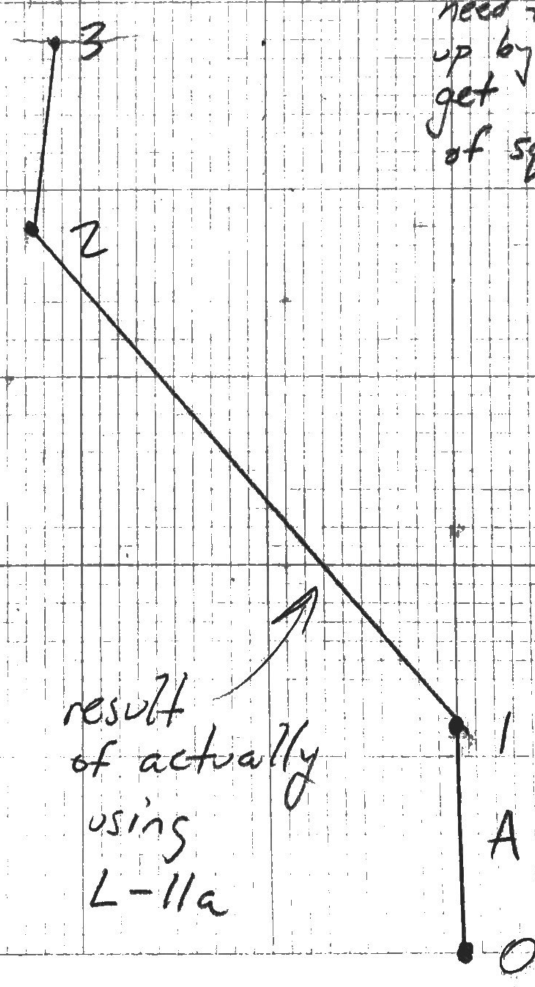
Below left is my estimate.
Make this more precise by noting that a rocket has to move with ~~v=~~ 0.75 to make $A_0 \to A_1$ be at rest. Treating $\underline{A_0}$ as the coincident coordinate origin

	t	x	L-11a $v = \frac{3}{4}$ →	t′	x′
A_0	0	0		0	0
A_1	4	3		2.65	0
A_2	7	1.75		8.60	−5.29
A_3	11	5		10.96	−4.91

↑ these numbers need to be scaled up by about 4.4 to get the number of squares

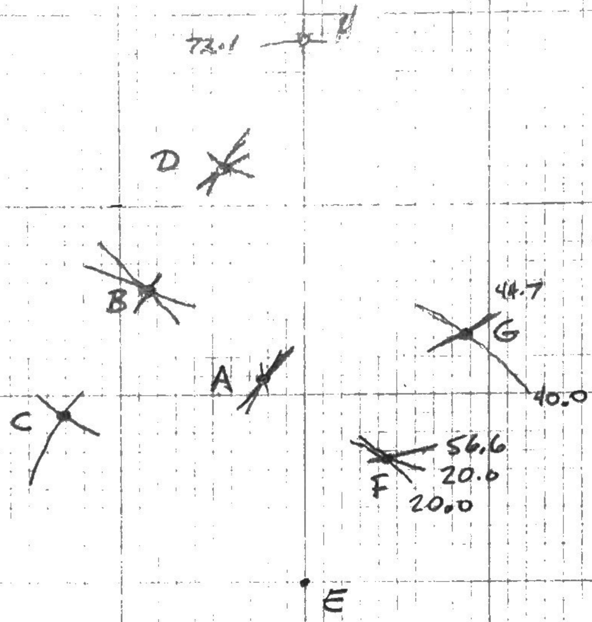


↑ my qualitative guess



result of actually using L-11a

1-6 (a)



(b) Yes

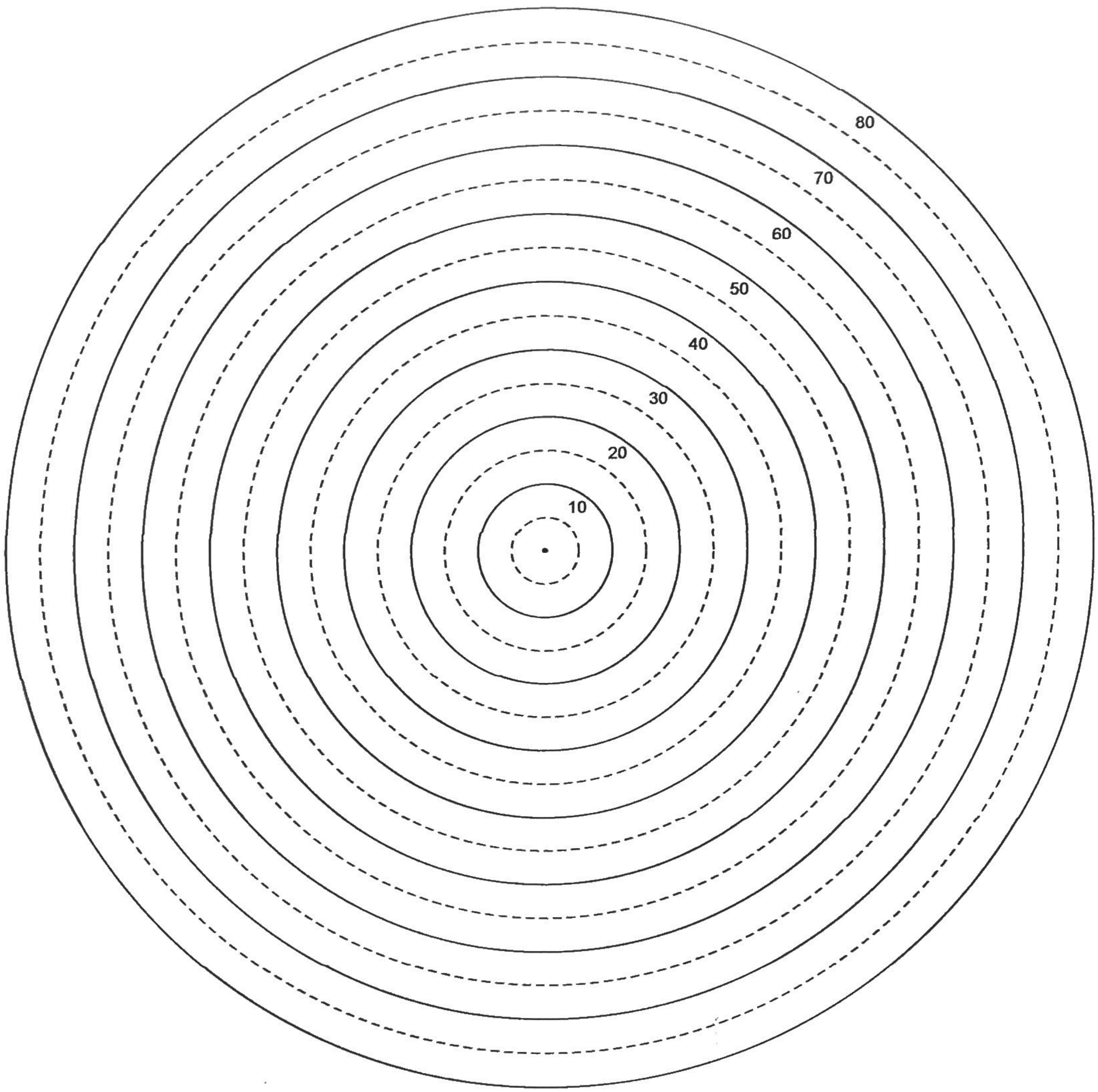
(c) Yes

In[144]:= dashedCircles = Graphics[{Dashed, Table[Circle[{0, 0}, 2 * i], {i, 1, 15, 2}]}];

In[145]:= solidCircles = Graphics[{Table[Circle[{0, 0}, 2 * i], {i, 0, 16, 2}]}];

In[146]:= labels = Graphics[Table[Text[Style[10 * i / 2, FontSize → 10],
    {1.2 * i - 0.48 , 1.6 * i - 0.64}], {i, 2, 16, 2}]];

In[147]:= Show[dashedCircles, solidCircles, labels]



5-3

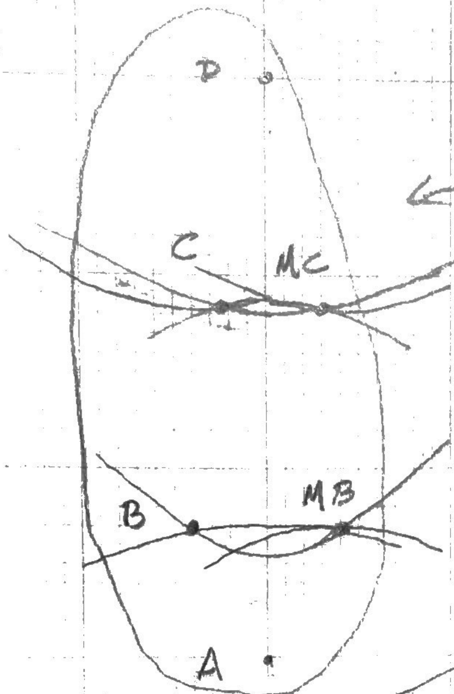
There are four solutions on this page:

← These two come from putting A and D at the same position → A, B, C, D

→ A, MB, MC, D

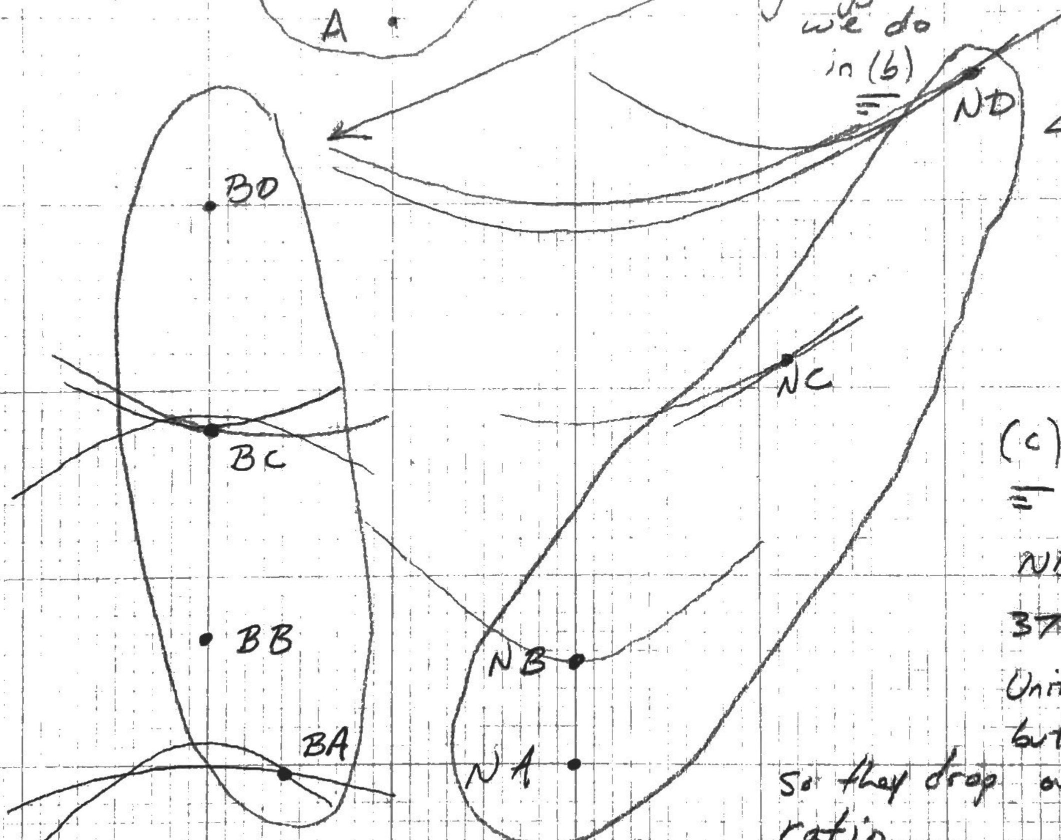
NA, NB, NC, ND

BA, BB, BC, BD



This is one they suggested we do in (b)

This is one they suggested we do in (a)

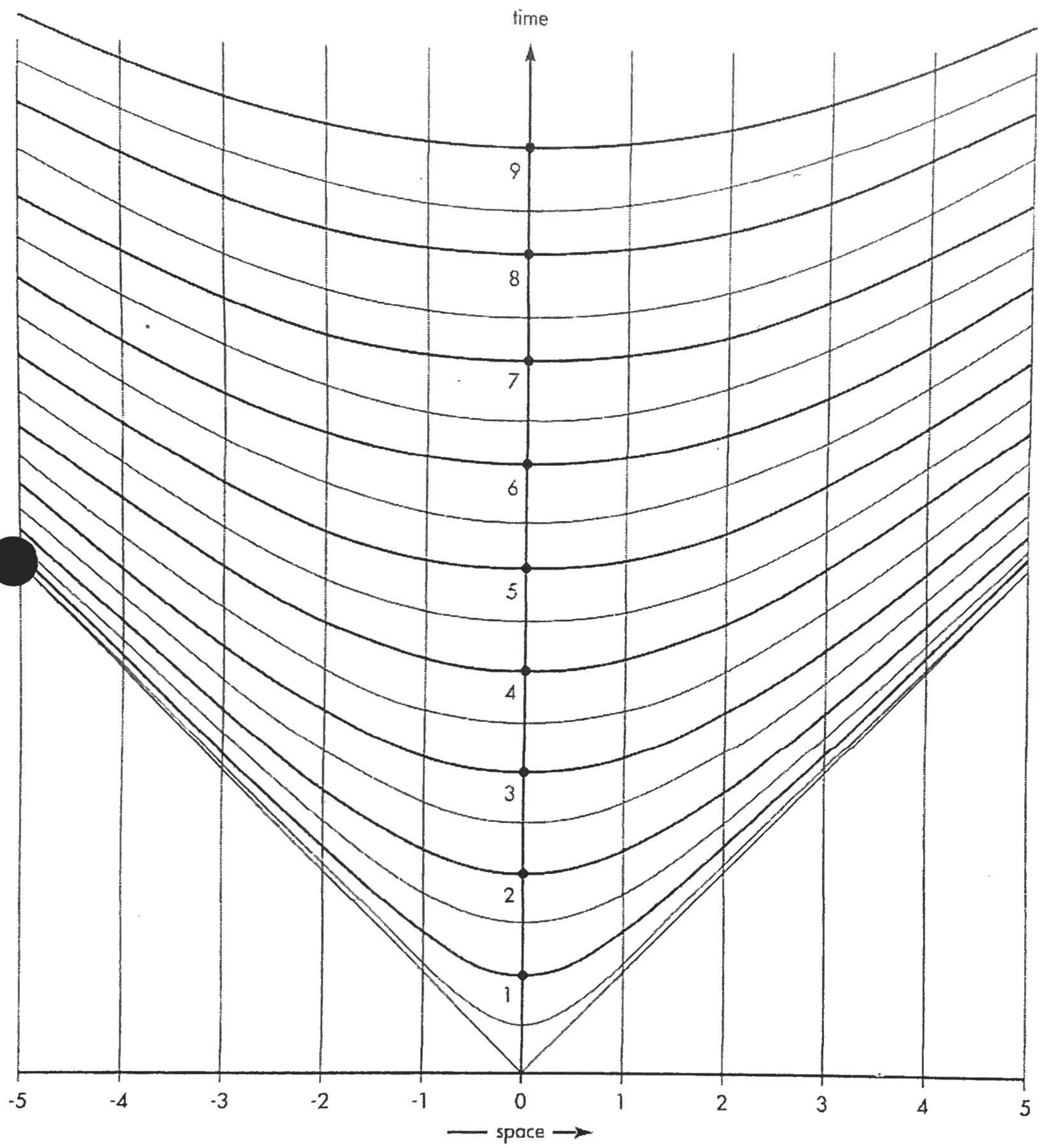


(c) 21 ½ squares across from NB to ND. 37 squares up. Units are arbitrary but the same so they drop out of the ratio

$$V = \frac{21.5}{37} = 0.58 \approx \frac{3}{5}$$

These same two events are at the same position in part (b).

(d) yes, and compare A, B, C, D with A, MB, MC, D.



EXERCISE 5-3. *Template of hyperbolas for converting intervals into a spacetime map.*

n paper so you can lay it over the hyperbola raph and see the hyperbolas.

Discussion: How to start? With three arbitrary lecisions! (1) Choose event *A* to be at the origin of the pacetime map. (2) Choose event *B* to occur at the ame place as event *A*. That is, event point *B* is located n the positive time axis with respect to event point *A*. spacetime locations arbitrarily. Then go on to plot event *D*.

Analogy to surveying: In surveying (using Euclidean geometry) you locate all points a given distance from some stake by using that stake as origin and drawing a circle of radius equal to the desired distance. In a spacetime map (using Lorentz geome-