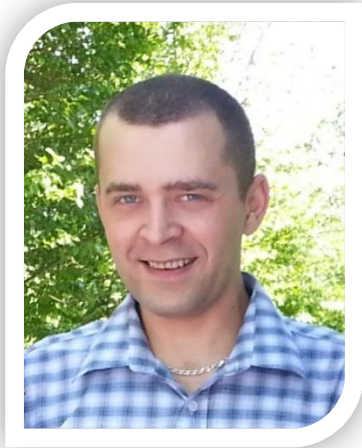


SECTION 2. Applied mathematics. Mathematical modeling.**Shevtsov Alexandr Nikolayevich**

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THE TRAJECTORY OF TEETHS RIPPER OF THE SOIL IN SPACE

The article considers the three-dimensional model calculation of the trajectory of teeth ripper of the soil.

Key words: soil, Ripper, Delphi.

Use Rippers of soils with trajectory movement of teeth, development of their construction and the increase of its effectiveness, defines the necessity of research of mathematical model Ripper. In order to study the workflow Ripper, when placed as suspended equipment for tractors, will determine the calculation of the trajectory of teeth of the work of the authority, when driving the tractor on the ground, given the change in speed of movement, rotation, and the lengths of the three links.

We adopt the following initial conditions:

- speed of rotation of top gear from 50 to 500 rpm.
- the length of the links will vary within limits.
- speed tractor varies from 1-10 km/H.

All received data will be documented in a table (table 1).

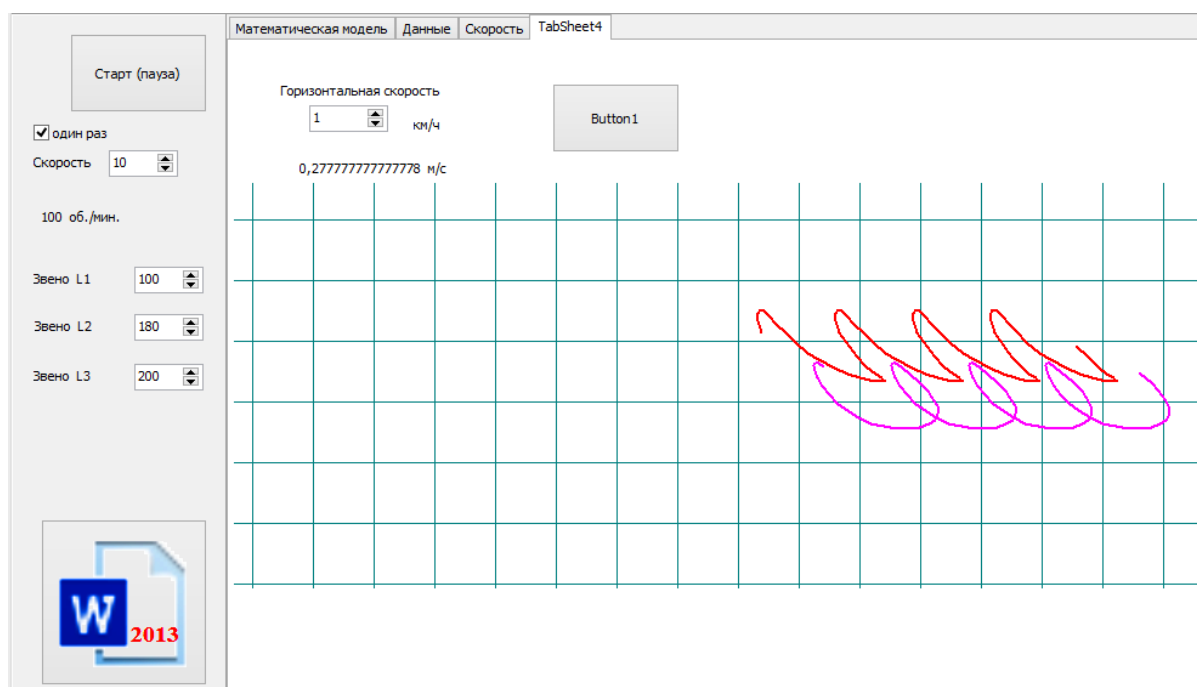


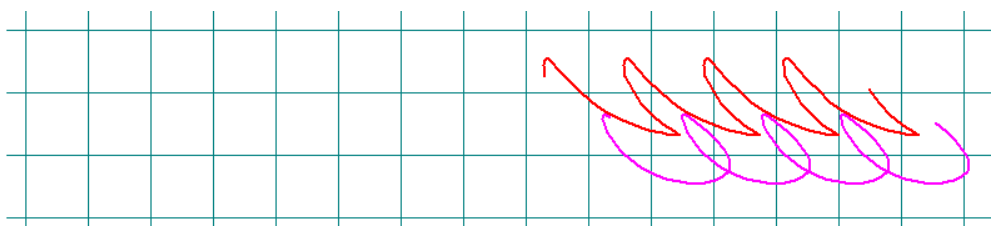
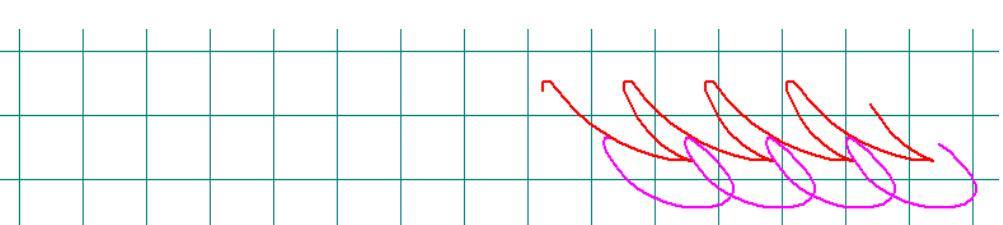
Figure 1 - Model at work.

Here we should take into account the speed tractor (Fig.1). Tractors of General purpose are subdivided into arable and transport [2]. Arable tractors intended for complete presowing tillage of soil in the fields. Arable tractors of the Russian manufacture have traction class from 3 to 10 ton-forces and power consumption from 25 to 30 horsepower per ton-thrust. Tracked tractors carry out plowing at speeds 6-10 km/h, and wheel - 10-20 km/H. Make the relevant calculations for tracked and wheeled tractors (table 1-5).

Table 1

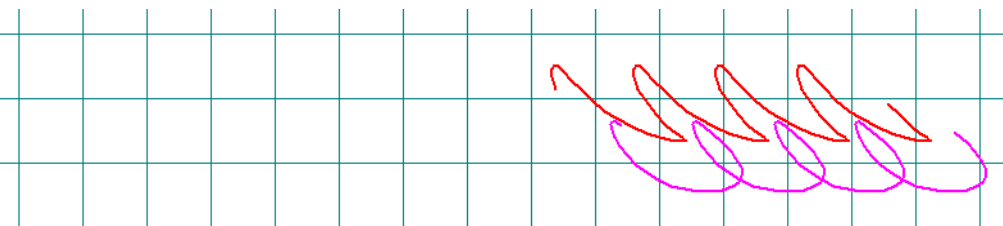
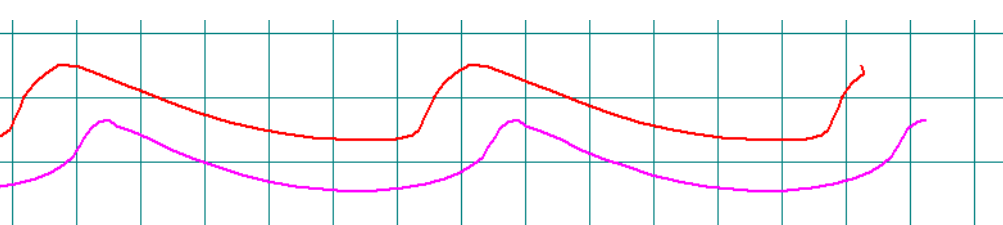
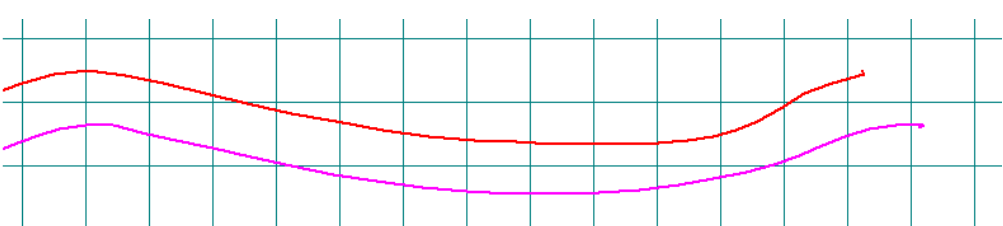
Change L_1 .

№	L_1 L_2 L_3 $V_{\text{вращ}}$ $V_{\text{тр.}}$	The trajectory in space

2	120 180 200 100 rpm 1 km/H	
3	140 180 200 100 rpm 1 km/H	

Consider a model when adjusting the speed of the tractor and the rotation mechanism.

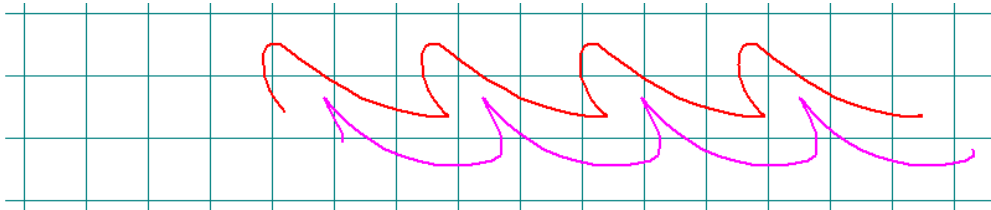
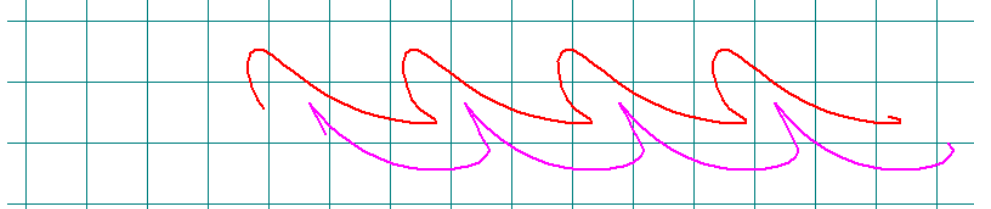
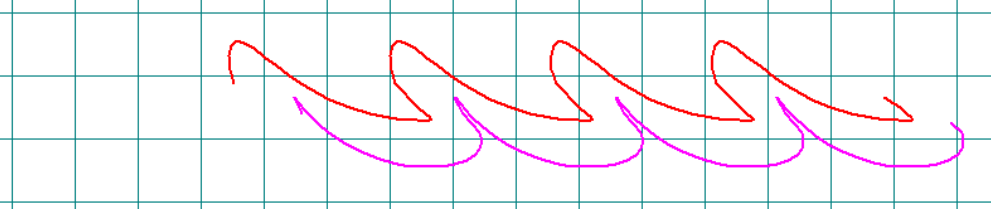
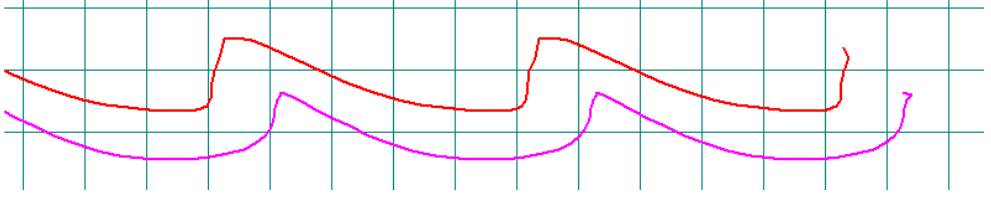
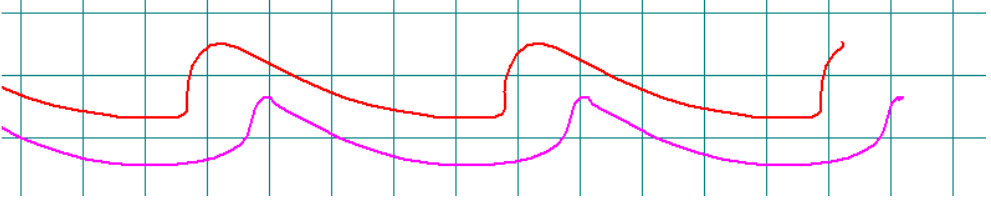
Table 2

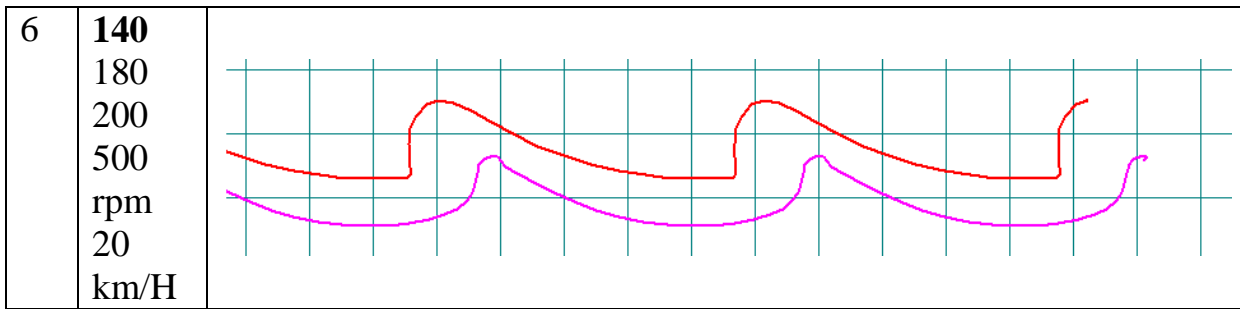
№	L_1 L_2 L_3 $V_{\text{трак}}$ $V_{\text{тр.}}$	<p style="text-align: center;">The trajectory in space</p>
1	100 180 200 100 rpm 1 km/H	
2	100 180 200 100 rpm 5 km/H	
3	100 180 200 100 rpm 10	

	km/H	
4	100 180 200 200 rpm 10 km/H	
5	100 180 200 312 rpm 10 km/H	
6	100 180 200 500 rpm 10 km/H	
7	100 180 200 500 rpm 15 km/H	
8	100 180 200 500 rpm 20 km/H	

Table 3

Change L_1 at 10 km/H and 20 km/H.

№	L_1 L_2 L_3 $V_{\text{спав}}$ $V_{Tp.}$	<p style="text-align: center;">The trajectory in space</p>
1	100 180 200 500 rpm 10 km/H	
2	120 180 200 500 rpm 10 km/H	
3	140 180 200 500 rpm 10 km/H	
4	100 180 200 500 rpm 20 km/H	
5	120 180 200 500 rpm 20 km/H	

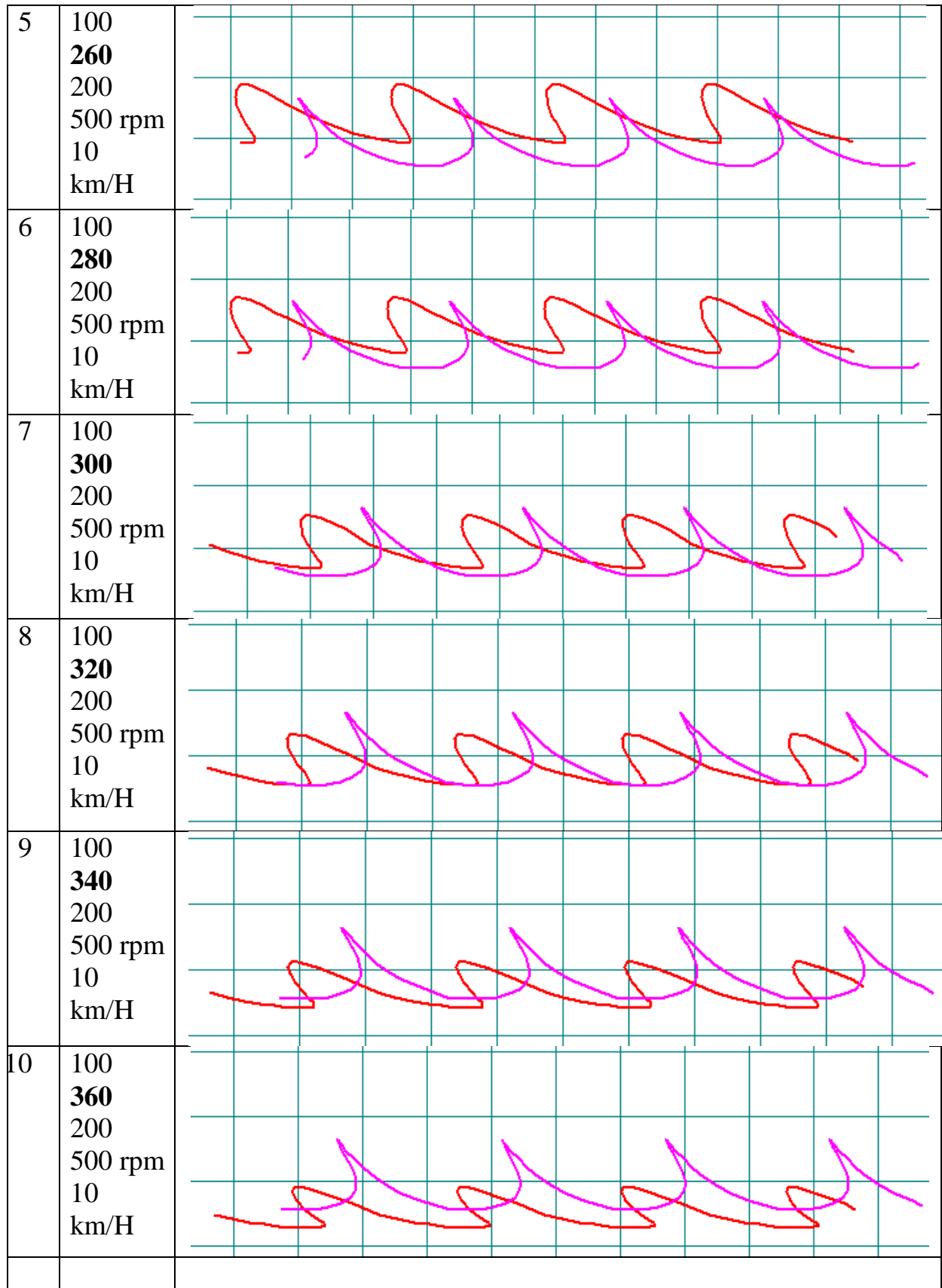


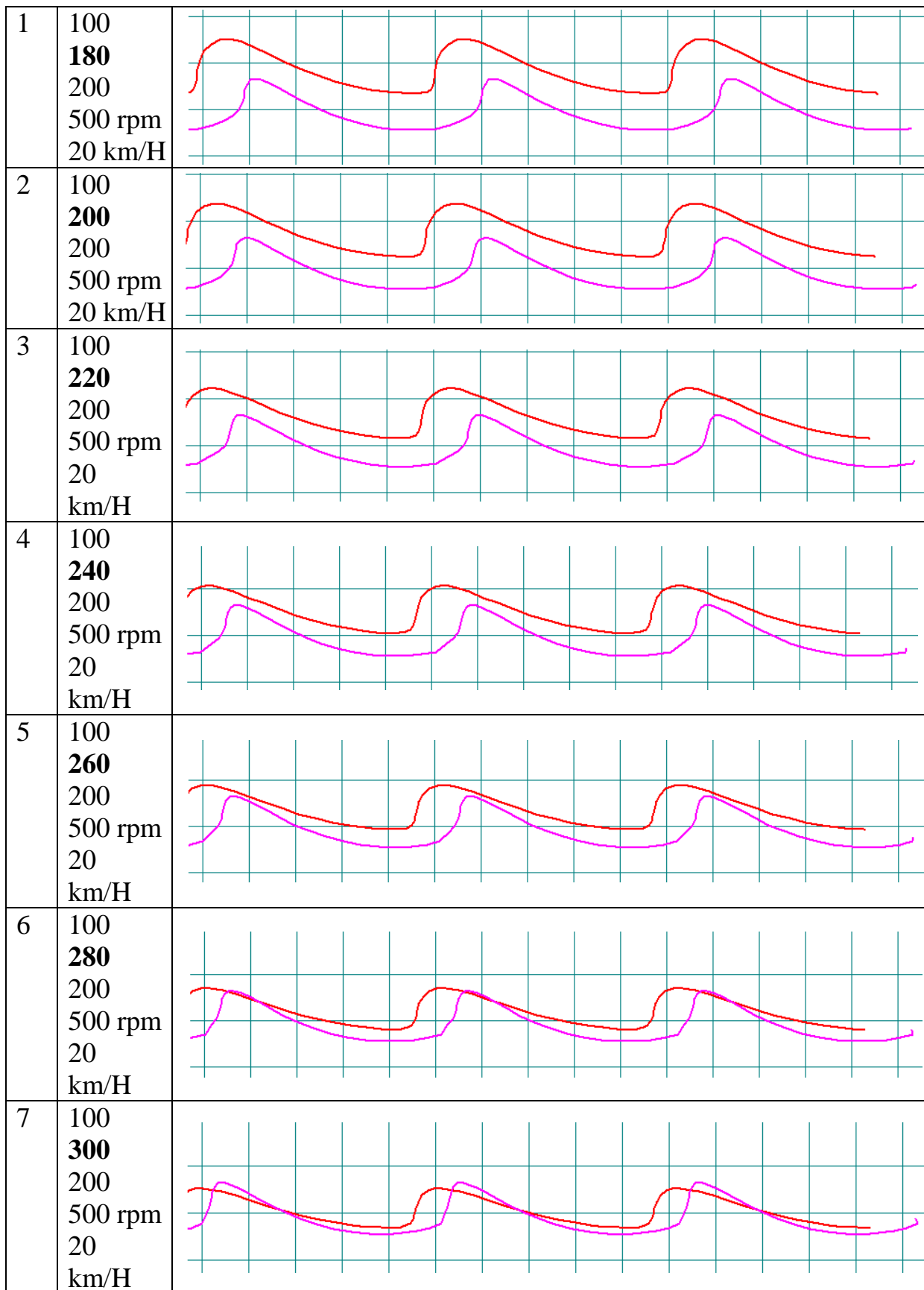
Consider now the change L_2 .

Table 4

Change L_2 at 10 km/h and 20 km/H.

№	L_1 L_2 L_3	The trajectory in space
1	100 180 200 500 rpm 10 km/H	
2	100 200 200 500 rpm 10 km/H	
3	100 220 200 500 rpm 10 km/H	
4	100 240 200 500 rpm 10 km/H	



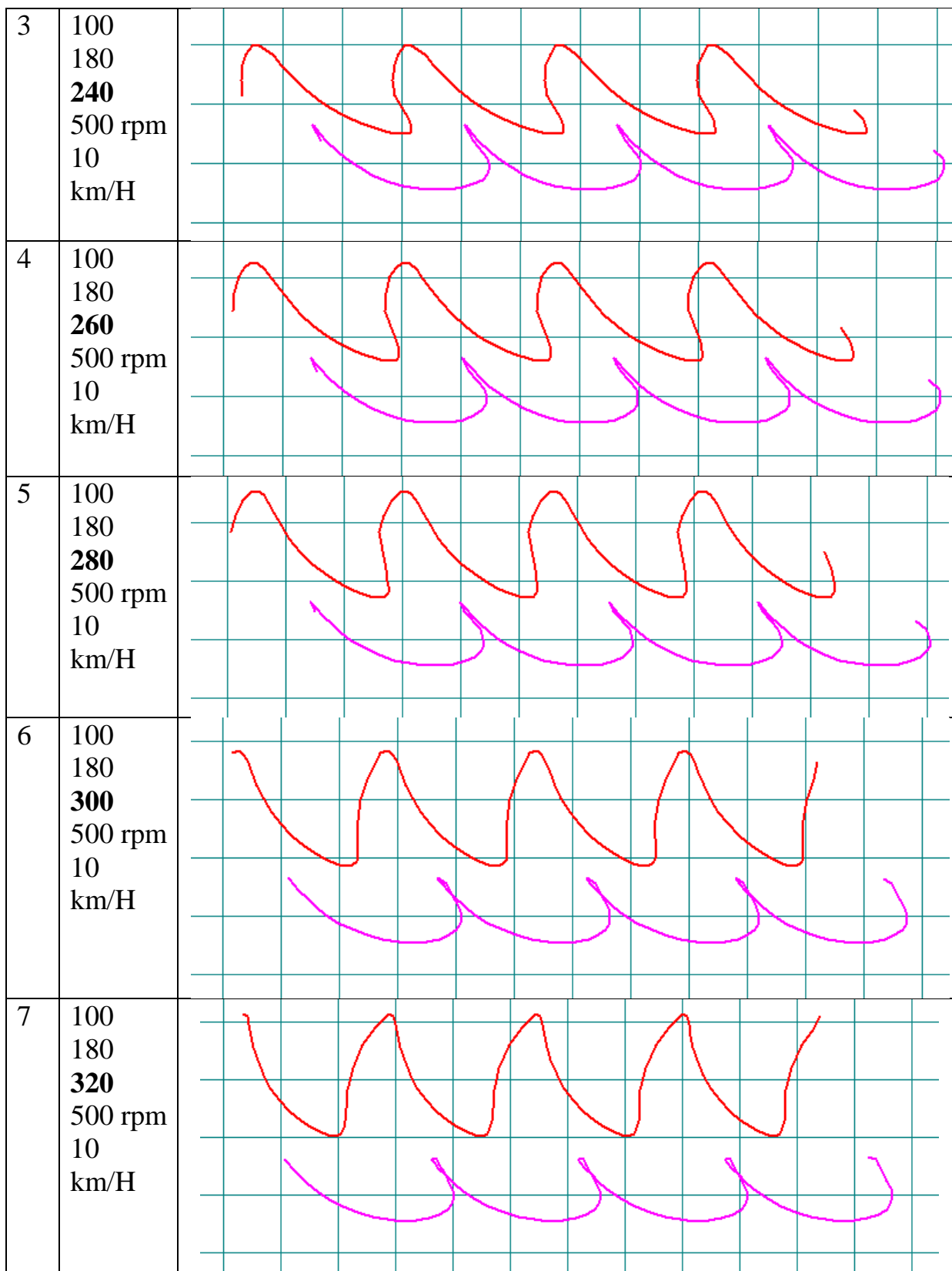


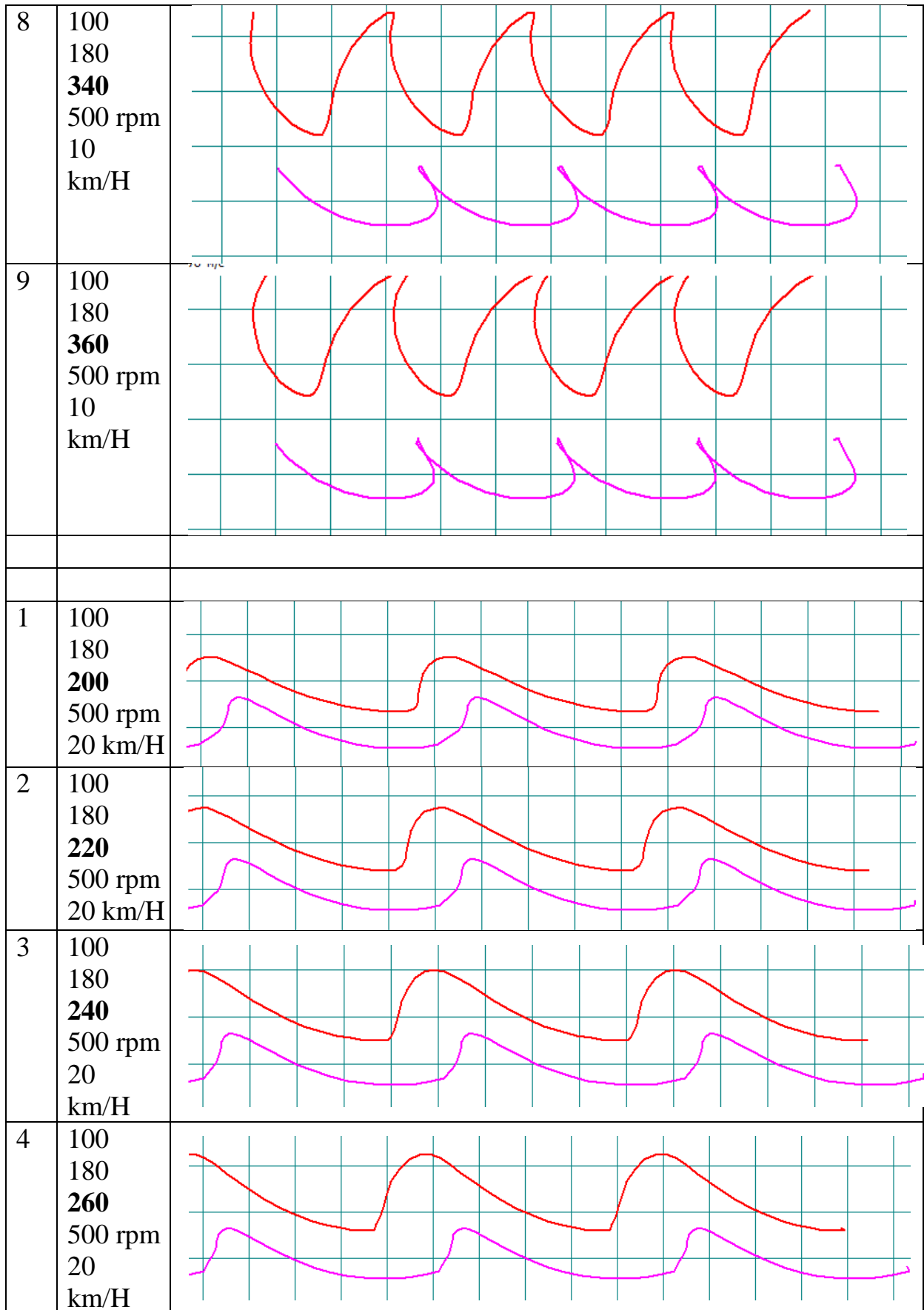
8	100 320 200 500 rpm 20 km/H	
9	100 340 200 500 rpm 20 km/H	
10	100 360 200 500 rpm 20 km/H	

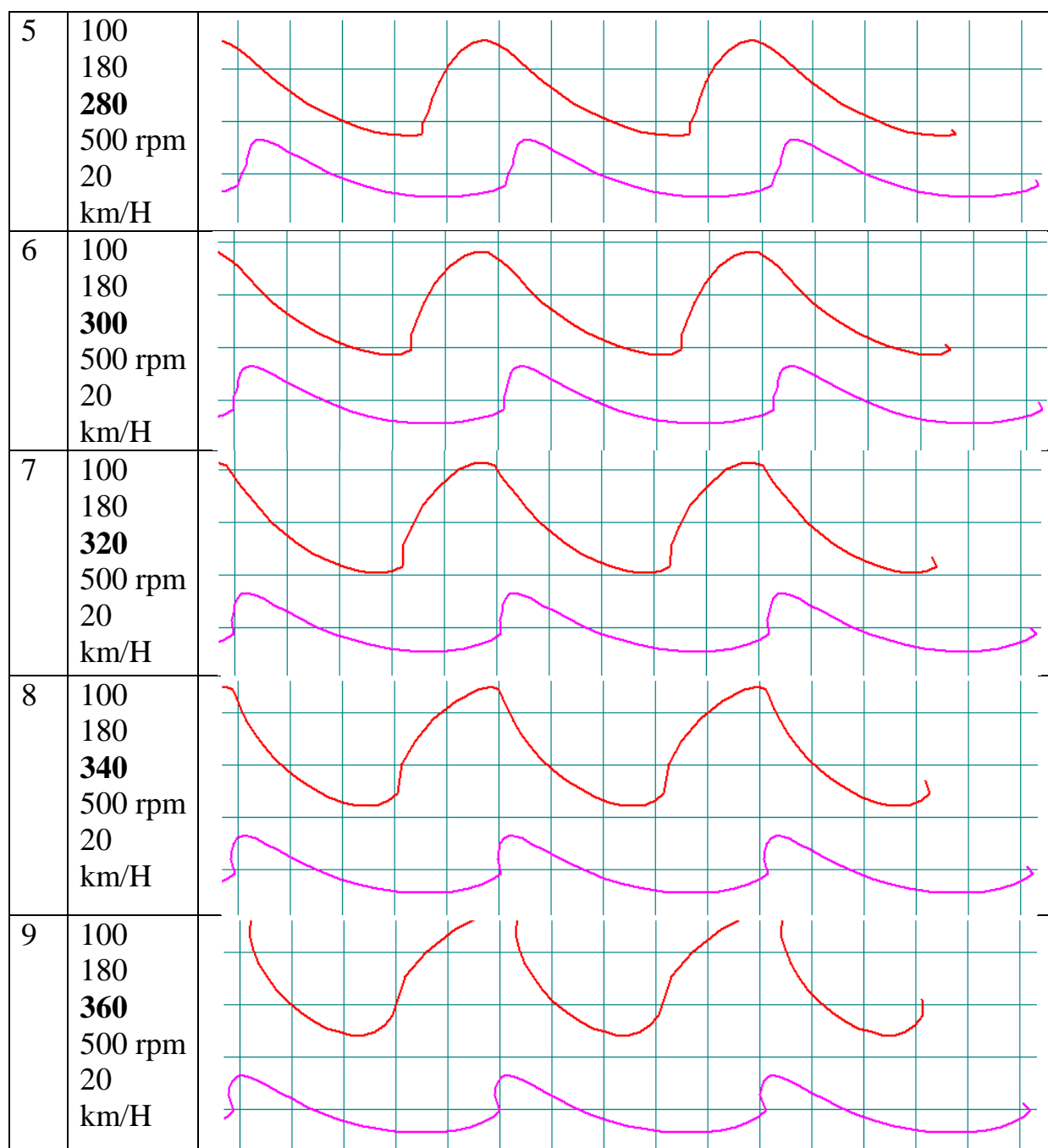
Table 5

Change L_3 at 10 km/h and 20 km/H.

№	L_1 L_2 L_3	The trajectory in space
1	100 180 200 500 rpm 10 km/H	
2	100 180 220 500 rpm 10 km/H	







Analysis of the obtained distribution of the trajectories you can choose the optimal variant of movement of teeth Ripper.

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