0 Question: A train is coasting around a large circular track. It is then switched to a smaller circular track. How does its speed change? Assume no friction.

A1: Speed gets slower

A2: Speed stays constant.

Arguments for A1

2 Question: Is total energy conserved?

A1: Yes

A2: Yes

3 Question: Is total energy equal to translational + rotational kinetic energy?

A1: Yes

A2: Yes

4 Question: Does rotational kinetic energy increase?

A1: Yes

A2: Yes

7 Question: All else being equal, if translational kinetic energy decreases, does the speed decrease?

A1: Yes

A2: No

Arguments for A2

1 Question: Is speed the magnitude of velocity?

A1: Yes

A2: Yes

6 Question: Without a force acting parallel to velocity, does the magnitude of the velocity decrease?

A1: It can

A2: No

8 Question: Is there any force acting parallel to velocity?

A1: No

A2: No