0 Question: A ball is attached to a pole by a string. The ball is swinging in a circle, and the pole is rotating freely, so that the part of the pole where the string is attached is always facing the ball. Now you stop the pole rotating, so the string starts wrapping around the pole. What happens to the speed of the ball?
(ignore effects due to gravity, assume the ball is a point mass)

A1: It's unclear

A2: The speed stays the same

Arguments for A1

2 Question: Is there an argument that it speeds up based on approximate conservation of angular momentum?

A1: Yes

A2: Yes, but momentum is not conserved

3 Question: Is there an argument that the speed stays constant based on approximate conservation of energy?

A1: Yes

A2: yes

4 Question: Do these arguments use similar levels of approximation?

A1: Yes

A2: no

Arguments for A2

1 Question: Does the energy of the ball change?

A1: There's an argument it doesn't, it's not entirely clear

A2: No

5 Question: If the energy remains the same does the speed remain the same?

A1: Yes, very likely

A2: Yes