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, and assume the ball is a point mass)

A1: It's unclear, there's an argument it speeds up and an argument it stays constant

A2: It remains constant

Arguments for A1

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

A1: Yes

A2: Yes

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

A1: Yes

A2: Yes

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

A1: Yes

A2: No

Arguments for A2

1 Question: Is the only force acting on the ball is tension from the string?

A1: Yes, it seems likely

A2: Yes

6 Question: Is the Tension always perpendicular to the direction of motion of the ball?

A1: Probably, it's not entirely clear

A2: Yes

8 Question: Given the only force on the ball is perpendicular to it, does this imply that the speed does not change?

A1: Yes, very likely

A2: Yes