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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: Its speed stays constant.

A2: It speeds up

Arguments for A1

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Question: If the kinetic energy of the ball stays constant, does its speed stay constant?

A1: Yes

A2: Very likely

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Question: If we don't do work on the ball, does its kinetic energy stay constant?

A1: Yes

A2: Very likely

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Question: Is the force on the ball always perpendicular to the motion of the ball?

A1: Yes

A2: It's unclear whether this is the case

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Question: As per the normal definition of work, does a force that is perpendicular to the motion of an object result in zero work?

A1: Yes

A2: Yes

Arguments for A2

1

Question: If a spinning mass is pulled towards the centre around which it's spinning, and it can move towards that centre, does it speed up?

A1: Yes, if angular momentum is conserved, which it is not in this case because the center of rotation changes.

A2: Yes

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Question: Does the string pull the ball towards the centre around which it's spinning?

A1: Yes, but the center about which it is spinning changes continuously after the pole stopped.

A2: Yes