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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)

| | |
|---|---|
| the speed stays the same | the speed increases |

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Is angular momentum approximately conserved?

| | |
|---|---|
| no | yes |