

Beth:D Tom:H wrapping ball

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List of Debates

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Side: None

Phase: Answer Questions Remaining: 0:42

At root

0 Q (H) 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)

H Its speed stays constant. D It speeds up

Notes

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

H Yes D Very likely

2 Payment: H ☐ D ☐ None ☒ Recurse

Notes

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

H Yes D Very likely

4 Payment: H ☐ D ☐ None ☒ Recurse

Notes

Q Is the force on the ball always perpendicular to the motion of the ball?

H Yes D It's unclear whether this is the case

5 Payment: H ☒ D ☐ None ☐ Recurse

Notes

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

H Yes D Yes

Q 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?

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

1 Payment: H ☐ D ☐ None ☒ Recurse

Notes Beth means: if a force acts on it towards the centre and causes it to get closer to the centre

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

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

3 Payment: H ☐ D ☐ None ☒ Recurse

Notes Beth means: the string exerts a force on it towards the centre and causes it to get closer to the centre (ie after moving for a while it ends up at the centre)

6

Payment: H ☐ D ☐ None ☒

Recurse

Notes

Work defined as the path integral over $F \cdot ds$.

