Moment of Inertia and Rotational Energy

Student comments from the pre-class assignment.

I thought it was interesting how we can relate kinetic energy to rotational velocity through inertia. It is just like the kinetic equations we were using before minus the inertia equation. I also thought it was interesting how the moment of inertia is very specific and we can't just say this is the moment of inertia of this body and we have to be specific.

The parallel axis theorem has completely confused me.

Where do the constants from the several equations on table 9.1 come from?

The line between all the different accelerations are still a bit fuzzy.

I'm still having trouble relating tangential acceleration, radial acceleration, and angular acceleration. I think it's not helping that we're now using greek to insert them in equations, so I'm trying to find a way that will help me to relate them to the original kinematics equations so that it becomes a more instant thought process- Since right now I'm spending more time trying to remember which greek letter means what than actually trying to solve the problem.

The most concerning thing I found was the table on moments of inertia of various bodies. Given how many of them there are, the only question I ask is this: You're not going to make us memorize those, right?

I do not understand what the moment of inertia really means. Also, if there are infinitely many axes, and infinitely many moments of inertia, how do we know which ones to choose?

I find the angular kinematics interesting in that they are similar to linear accelerations, speeds and position problems.

At what point does a hollow cylinder become a thin-walled hollow cylinder?

I had a difficult time understanding some of the reading. For instance when they were describing the proof for the parallel axis theorem I couldn't picture what the book was describing

Since I work at a bicycle shop, I found the part about the metal linkages and the parallel-axis theorem to be interesting from the stand point of a bicycle chain.

I didn't have much trouble for the reading but finding the diameters for a CD wasn't the easiest thing because no one would agree on what standard was even though there is clearly a standard.

Could you explain why the equation for moment of inertia changes depending on the axis that is chosen?

Moment of inertia is a terrible name since it has nothing to do with time.
There were moments of inertia pictures that were listed for various bodies. Are those necessary to memorize???? Furthermore, there were a lot of interesting but quite difficult concepts like the moment of inertia and other ones that are slightly different than what the average person would hear. Also, the "Parallel of Axis" theorem that was in Section 12.5 was really technical. If you could break it down for us that would be great. :) The Parallel axis theorem confused me, Ip equals the moment of inertia of the center of mass plus Mass * distance squared? What is Ip vs Icm.

Trying to do these worked problems and relate to the reading, I am not sure how the equations work. I guess I am getting confused with the greek letter being in the equation. Need more examples and explanations of how to solve these.

I did not understand table 9.2 (moments of inertia of various bodies). I tried to relate the table and the reading to problem 4 on the warm-up, but it did not add up.

Most of the reading was understandable but I would like to learn more about computing moment of inertia the parallel axis theorem.

I was mostly confused by the moment of inertia calculations and how it is dependent upon the body’s density. Specifically why are we able to move the density out of the integral when the density is uniform, but it must remain inside the integral when the density is not uniform in the body.

Alex Nino: any other parallel axis examples that we use in real life? can you explain #2 better.

What are the equations for the moments of inertia? The book says distance from the mass' particles to the specified axis, but what about the case in which there is an x, y, and z axis that go through the same point

Calculating the moment of inertia was particularly challenging for me. i would like to hear a more in dept explanation for that.

I’m having problems with the applications of these equations. This seems to be pretty normal for me. The book does a really good job of explaining how they get to the equations but I don't get much from their applications. I realize this a general statement about the book but it rings true for these sections for me.

The most difficult part in this whole chapter seems to be picturing the actual problems. It was easy picturing projectile motion and one dimensional motion, but the different axis that things rotate it confuse me.

The relationships between force and inertia and energy in terms of rotational systems seem very similar to linear in many ways.

I’m having a hard time understanding the parallel-axis theorem. I just don't get when or why it's used and why parallel axes make a difference.
I feel like the reading didn't really show much in terms of good examples with radians per second.

I know I shouldn't reference the warm-up, but my carelessness led me to do lesson 24 instead of 23, guess I'll be a little ahead of the curve on Tuesday...

The parallel axis theorem would be something I'd like to go over in class. Score: 2

The concept of having mass further away from the axis causing more inertia, interested me and made me wonder if it's the moment of inertia plays a part in the way that an ice skater speeds up when they reduce the length of their arm span.

Anytime I see summation notation I get confused. I think that I just need to work out some problems to fully understand.

I think I understand what moment of inertia is and that it tells us how hard it is to get an object to rotate about an axis, but I am in a way unsure of if this is correct. Also I found the last chapter 9.6 to be sort of confusing. I understand the steps that were done to do the integration; however, when I tried the last example I got a different result, but I did get the first one correct with a little help from the book. I feel as if I could do these problems if I had more practice with one maybe in class.

Having hard time picturing the figure which describes the parallel-Axis Theorem.

I am completely confused on how to calculate the moment of inertia. I don't understand the ith part at all.

The thought of having to use problem solving techniques on this makes me want to cry.

The most confusing part was the parallel axis theorem. I didn't quite grasp what it was saying.

In the textbook page 292 example 9.8, unwinding a cable II. They solve for velocity from the kinetic energy equation. I was unable to isolate velocity from the equation with the same result. No work was shown, and I would like to understand what was done and how it was done.