



## Review Physics 121 Midterm Exam # 3

• Warning:

- Use this review at your own risk.
- I can not cover everything we discussed in 8 lectures in the period allocated for this review.
- If I leave out certain topics in this review, this does not imply that these topics will not be covered on the exam!
- The material covered on the exam is the material covered in Chapters 10, 11, 12, and 14 of our text book.

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## **Rotational Motion**

- There are many similarities between linear and rotational motion.
- If you really understand linear motion, understanding rotational motion should be easy.
- The concepts of moment of inertia, torque, and angular momentum are defined such as to preserve the similarities between linear and rotational motion.
- I will start this review with focusing on a detailed comparison between linear and rotational motion.

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	Summary of F	Rotational V	ariables.
		Definition	Linear Variable
Aı	ngular Position	θ	$l = R\theta$
Ar	ngular Velocity	$\omega = \frac{d\theta}{dt}$	$v = R\omega$
Ang	ular Acceleration	$\alpha_{\rm tan} = \frac{d^2\theta}{dt^2}$	$a_{\rm tan} = R\alpha_{\rm tan}$
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	Equ	ations of Rotation Constant Acceler	al Motion. ation.
		Rotationional Motion	Linear Motion
	Acceleration	$\alpha(t) = \alpha$	a(t) = a
	Velocity	$\omega(t) = \omega_0 + \alpha t$	$v(t) = v_0 + at$
	Position	$\theta = \theta_0 + \omega_0 t + \frac{1}{2}\alpha t^2$	$x(t) = x_0 + v_0 t + \frac{1}{2}at^2$
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 $\omega = \sqrt{(k/m)}$ Frank L. H. Wolfs

















Final Remarks
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• The hardest part of each problem is recognizing the approach to take. Different approaches may lead to the same answer, but can differ greatly in difficulty.

- A suggestion: Look at the end of chapter problems. There is only a limited number

  - Look at the end of chapter problems. There is only a limited number of types of question one can ask.
    But ...... Since the questions are grouped by section, you know already what approach to use based on the section to which the problems are assigned.
    Some students benefit from copying the questions, cutting them out, writing the chapter/section numbers on the back, mixing them up, and then reading through them and determining what approach you would take if you would see that question on the examt (compare it with the focus of the section to which the problem was assigned).

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## Final Remarks

- You will only need your pen, a pencil, and an eraser. Being awake might also help!
  The TAs will have extra office hours on Monday. Please go and see them if you need to resolve any last-minute evention.
- The exam will start at 8 am and end at 9.30 am. If you show up late you will just have less time to finish. Over the years I have heard every excuse possible for being late, but I have never heard one that I accepted.

## Good luck preparing for the exam.

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