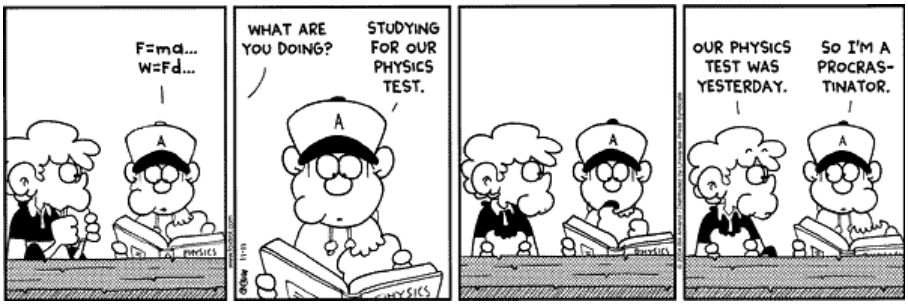
October 8, 2012 Physics 131 Prof. E. F. Redish

■ **Theme Music:** **Van Morisson**

Checkin' It Out

■ **Cartoon:** **Bill Amend**

FoxTrot



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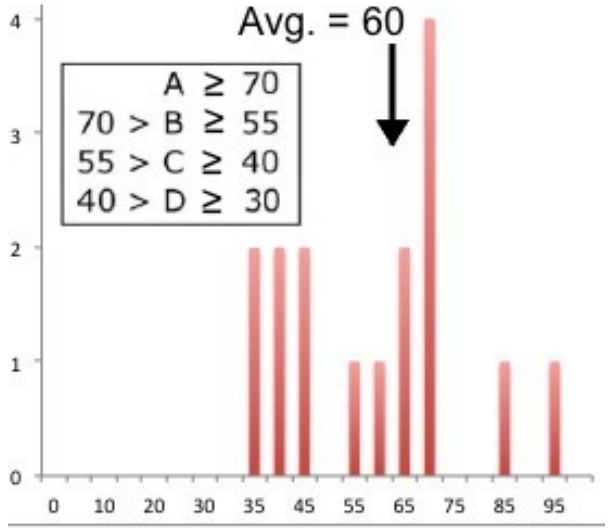
Exam 1



Prob.	#1	#2	#3	#4	#5
Max pts	25	25	15	10	25

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Results on individual problems

Problem 1	80%
Problem 2	57%
Problem 3	65%
Problem 4	72%
Problem 5	**40%**

	1.a	1.b	1.c	1.d	1.e
1	6%	0%	6%	0%	0%
2	81%	0%	94%	25%	0%
3	0%	0%	0%	13%	0%
4	6%	0%	0%	13%	6%
5	19%	0%	0%	0%	6%
6	6%	94%	0%	0%	81%
N	0%	6%	0%	50%	0%

Problem 4

One of the things we try to do in a physics course is to take everyday concepts, such as motion or force, and refine them into more precise terms; often splitting everyday concepts so as to allow a more specific description and the development of physical laws.

One example is the dividing of the concept of "motion" into "velocity" and "acceleration." For the concept of *force* discuss in what way the everyday concept of force is split in physics and discuss one example from this class where not paying attention to this split might cause confusion.

Note: This is an essay question. Your answer will be judged not solely on its correctness, but for its depth, coherence, and clarity.

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Sample essay

Just like motion, force can mean a number of different actions in our everyday life (forcing someone to do something, physical force, Star Wars force). In physics, force is split into contact forces and non-contact forces which can be further divided into forces such as gravitational force, friction force, tension force, etc. By dividing forces into these descriptors, we can better apply them to different situations. For example, a free-falling object can have a force described as $F_{net} = m_A g$ (ignoring friction, drag, viscosity, etc.). However, this basic law $F_{net} = m_A a_A$ cannot be applied to other situations directly such as tension forces, which are instead loosely defined by Hooke's law ($T = k\Delta L$). If you used the first law, you would say there is no acceleration therefore there is no force. However, there is still a force. It is simply being cancelled out by an opposite force of the same magnitude. Dividing forces into the previously stated categories allows us to better understand each unique situation.

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