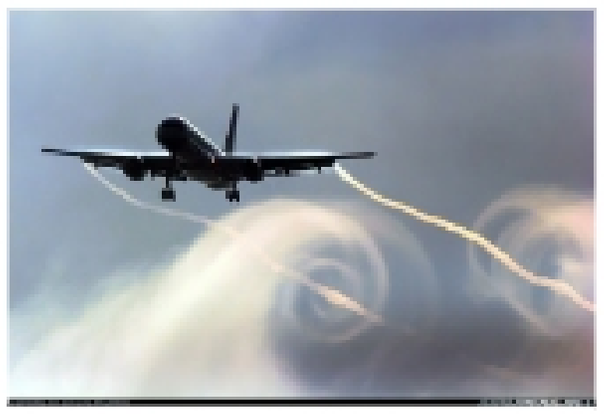
Physics 121.
Thursday, February 28, 2008.



Physics 121.
Thursday, February 28, 2008.

- Course Information
- Quiz?
- Topics to be discussed today:
  - The center of mass
  - Conservation of linear momentum
  - Systems of variable mass

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- Homework set # 5 is now available on the WEB and will be due next week on Saturday morning, March 8, at 8.30 am.
- This homework set contains WeBWorK problems and a video analysis.
- The most effective way to work on the assignment is to tackle 1 or 2 problems a day.
- If you run into problems, please contact me and I will try to help you solve your problems (Physics 121 problems that is).

Homework Set # 5.
WeBWorK problems.

Finding $U(x)$
The escape velocity

Conservation of energy (including "friction" losses)

Inelastic collisions and conservation of energy

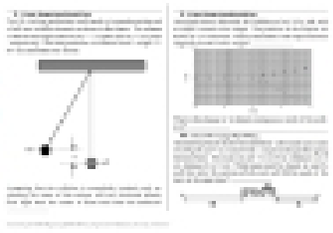
Rocket motion

Collision force

2D collision

Homework Set # 5.
WeBWorK problems.

Elastic collisions and conservation of energy



2D collision

Explosion in 1D

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Thursday, February 28, 2008.

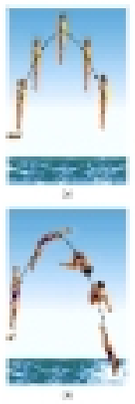
- We will grade Exam # 1 this weekend, and the grades will be distributed via email on Monday.
- The exam will be returned to you during workshops next week. Please carefully look at the exam and if you made any mistakes, try to understand why what you did was not correct. If you disagree with the grade you received, you need to come and talk to me. Your TAs can not change your exam grade.
- The next exam will take place on March 25. Please do not wait until the day before the exam to start studying!

Physics 121.
Quiz lecture 12.

- The quiz today will have 3 questions and provide me with feedback on Exam # 1.
- Note: each answer you submit is correct!

The Center of Mass.

- Up to now we have ignored the shape of the objects were are studying.
- Objects that are not point-like appear to carry out more complicated motions than point-like objects (e.g. the object may be rotating during its motion).
- We will find that we can use whatever we have learned about motion of point-like objects if we consider the motion of the center-of-mass of the extended object.



But what is the center of mass and where is it located?

- We will start with considering one-dimensional objects. For an object consisting out of two point masses, the center of mass is defined as

$$x_{cm} = \frac{m_1 x_1 + m_2 x_2}{m_1 + m_2} = \frac{1}{M}\sum_i m_i x_i$$