

MA205 Lesson 15

Beer Math 1

Wednesday, September 12, 2007

Outline

- 1 From Lesson 14
 - Work
- 2 Work on Fluids
 - Work on Fluids
 - Beer Math 1
- 3 Look at for Next Time

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Work

- Work is Force times Distance.
- Work is $\int_a^b f(x)dx$ where $f(x)$ is the force.
- For example if we want to lift a box of coal weighing 800lbs out of a mine shaft 500 feet deep with a cable weighing 3lbs per foot we get. $\int_0^{500} (800 + 3x)dx$

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Steps to find work done on fluids

- 1 Work is still Force times Distance.
- 2 Now we need to find mass again and integrate over the distance.
- 3 We find the mass by remembering that mass is density times volume - $m = \rho V$
- 4 So now we need to find the volume of the container we are moving fluid out of. Volume is length times width times height - $V = lwh$.

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- How much work is required to syphon beer out of a carboy that is 20" high and has a diameter of 10.5" with beer up to 13" in the carboy. Where this beer weighs 60 lbs per cubic foot.



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- How much work does the CO₂ bottle do to dispense beer out of a keg that is 26" high and has an 8" diameter with beer up to 24". Where this beer weighs 60 lbs per cubic foot.



Probability of getting a ticket

- Look at the course guide
- Stewart Chapter 8, Section 5, PG 575-581.

Questions