

# Exam 2 statistics

Mean = 71.9

Median = 74

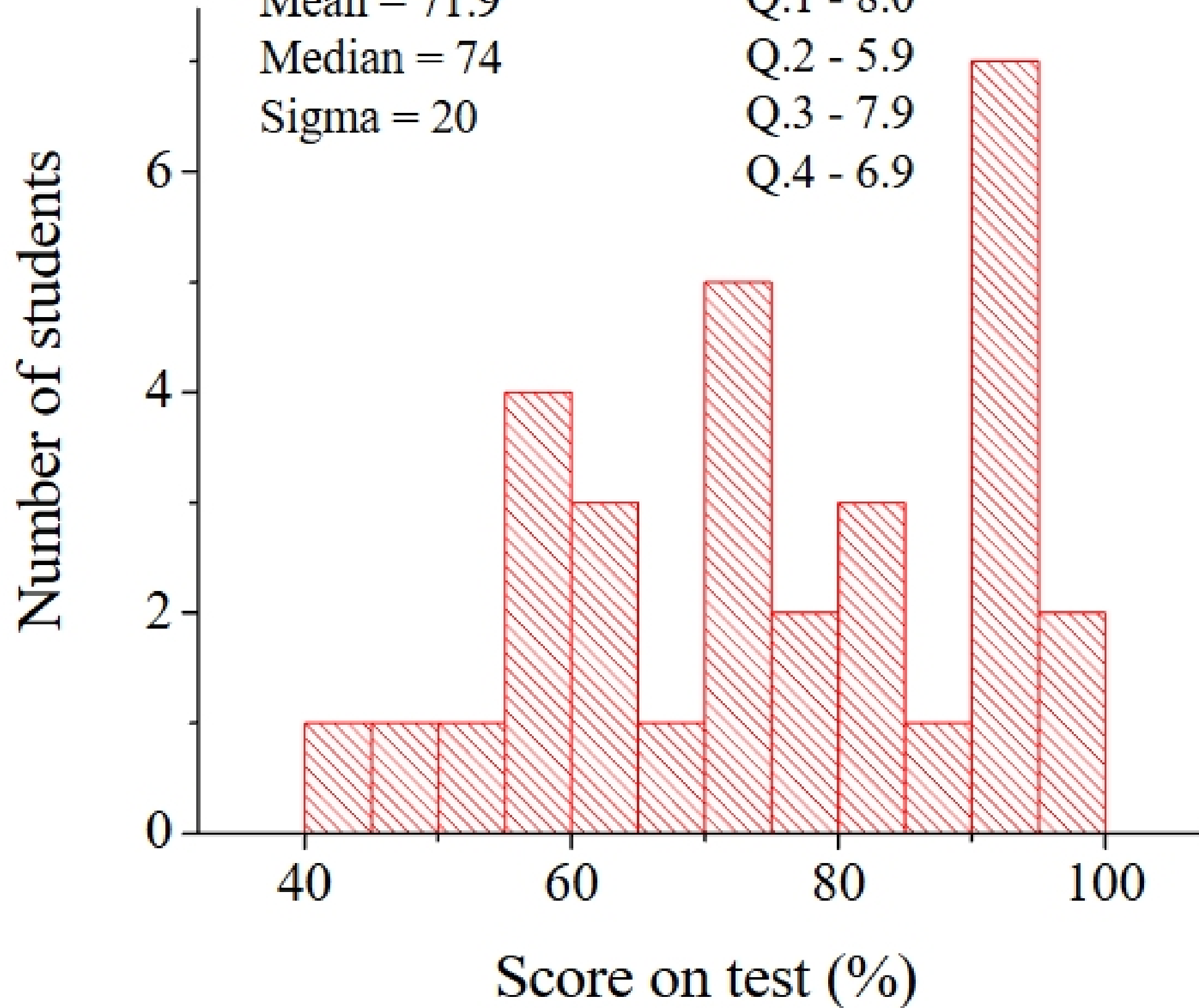
Sigma = 20

Q.1 - 8.0

Q.2 - 5.9

Q.3 - 7.9

Q.4 - 6.9



# Lecture 17 - The Magnetic Field of a Current

## Chapter 33 - Tuesday March 20th

- A brief review of the exam
- Reminder about Lorentz contraction/time dilation
- Interaction force between parallel currents
- The magnetic field of a current
- The magnetic field of a moving charge
- The *Biot-Savart* law

Reading: pages 749 thru 760 (up to section 33-5) in HRK

Read and understand the sample problems

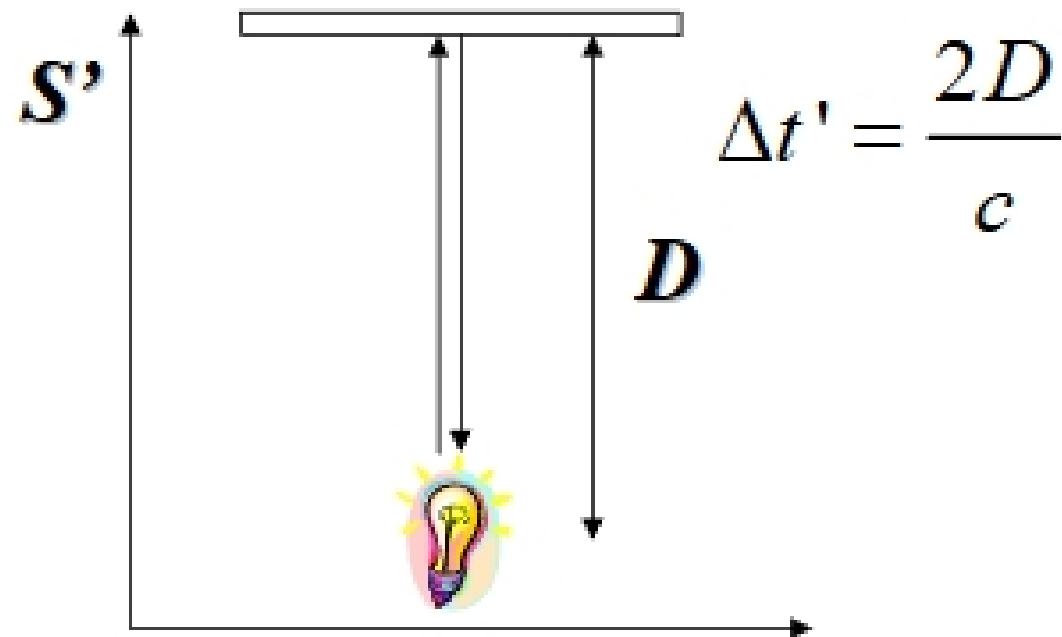
*Next WebAssign deadline will be on Monday at 11:59pm*

Homework set (Ch. 33): I will post these later today

Practice problems: Ch. 33 - Ex. 5, 15, 21; Prob. 1

# Time dilation

$$l_h^2 = D^2 + l_a^2 = D^2 + \left(\frac{v\Delta t}{2}\right)^2$$



$$(\Delta t)^2 = \left(\frac{2l_h}{c}\right)^2 = \frac{4}{c^2} \left[ D^2 + \left(\frac{v\Delta t}{2}\right)^2 \right]$$

$$\left(1 - \frac{v^2}{c^2}\right) (\Delta t)^2 = \left(\frac{2D}{c}\right)^2 = (\Delta t')^2$$

$$\Rightarrow \Delta t = \gamma \Delta t', \text{ where } \gamma = \frac{1}{\sqrt{1 - \beta^2}} \text{ and } \beta = \frac{v}{c}$$

