Big idea: $\bar{X}$ has mean $\mu$, variance $\sigma^2/n$, and (if $n$ is large) is approximately normal.

1. Some simulations.
2. The Central Limit Theorem.
3. Distributions of sums of random variables.
   (a) $E(Y + Z) = E(Y) + E(Z)$
   (b) $E(cY) = cE(Y)$
   (c) If $Y$ and $Z$ are independent, $\text{Var}(Y + Z) = \text{Var}(Y) + \text{Var}(Z)$.
   (d) If $Y$ and $Z$ are normal and independent, $Y + Z$ is normal.
4. If $X$ is normal, $\bar{X}$ is normal.

**Homework - due Thursday, April 3, 2008**

1. Read Section 5.2.
2. Do problem 5.3, 4, 5.

**Useful R**

```r
> sr=read.csv('http://www.calvin.edu/~stob/data/sr.csv')
> m2=combn(sr$GPA,2,mean)
> histogram(m2)
> m5=replicate(100000, mean( sample(sr$GPA,5,replace=F)))
> histogram(m5)
```