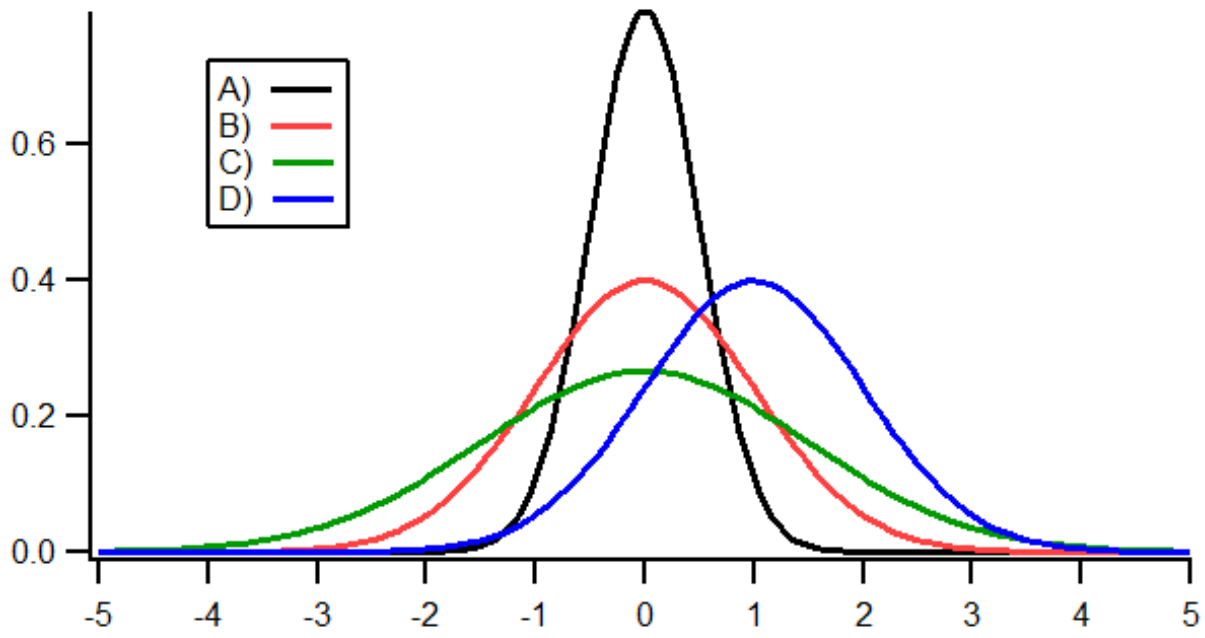
Normal Distribution

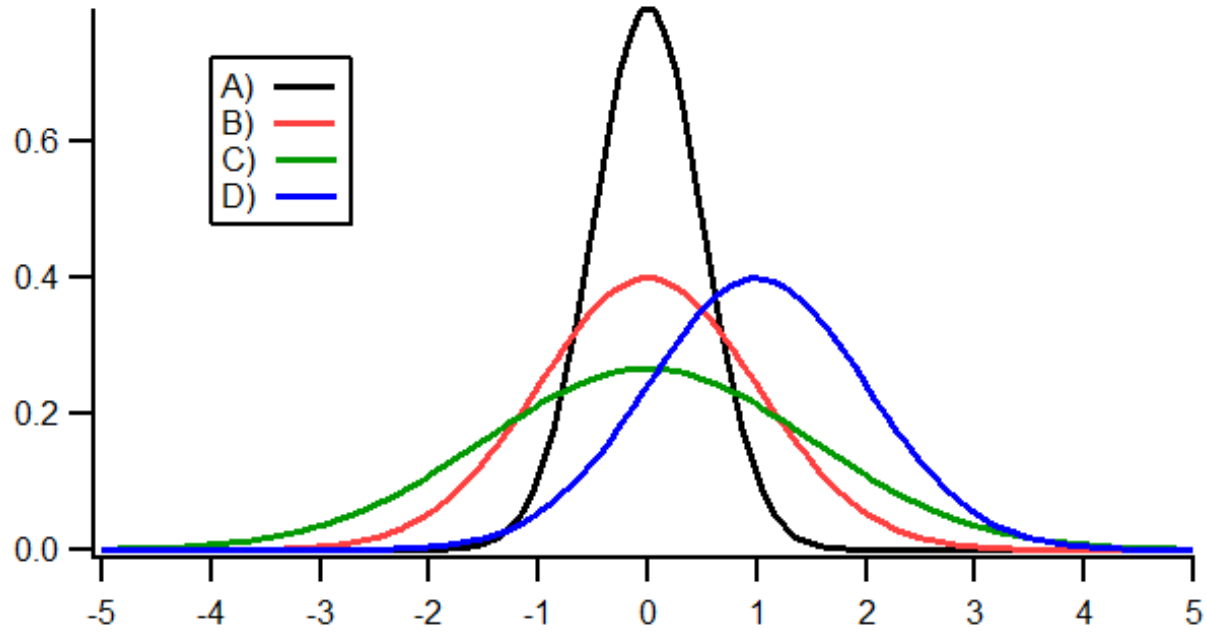
Tuesday, September 18, 2012
11:39 AM

Which distribution has the largest standard deviation?



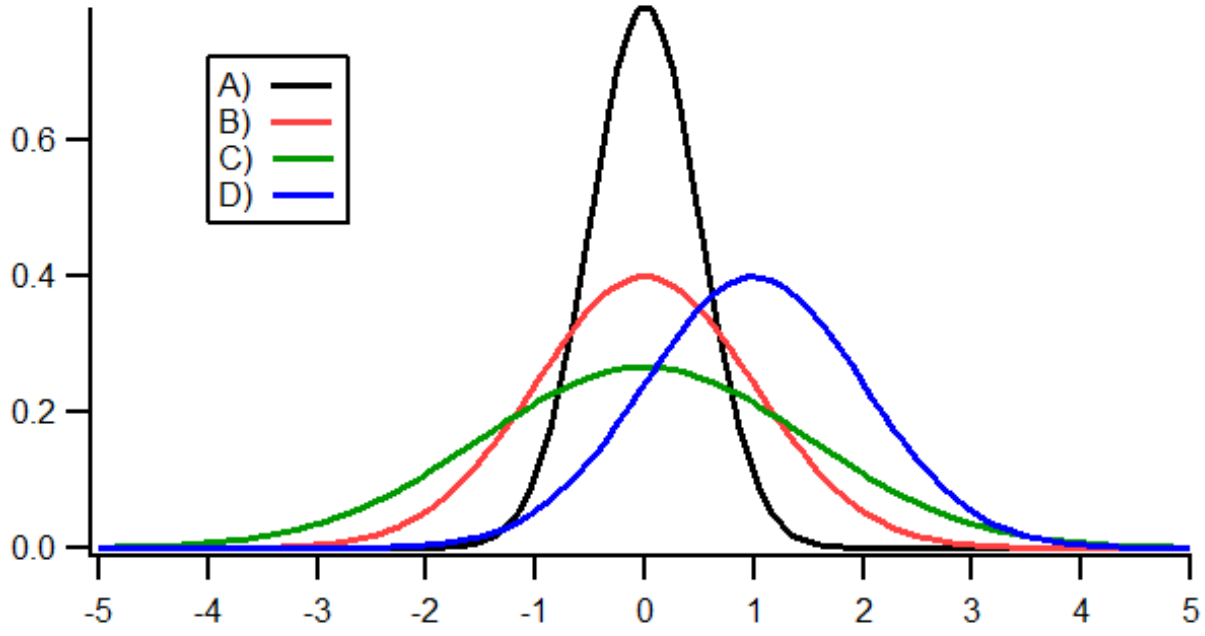
E) They're all the same

Which distribution has the largest mean?



E) They're all the same

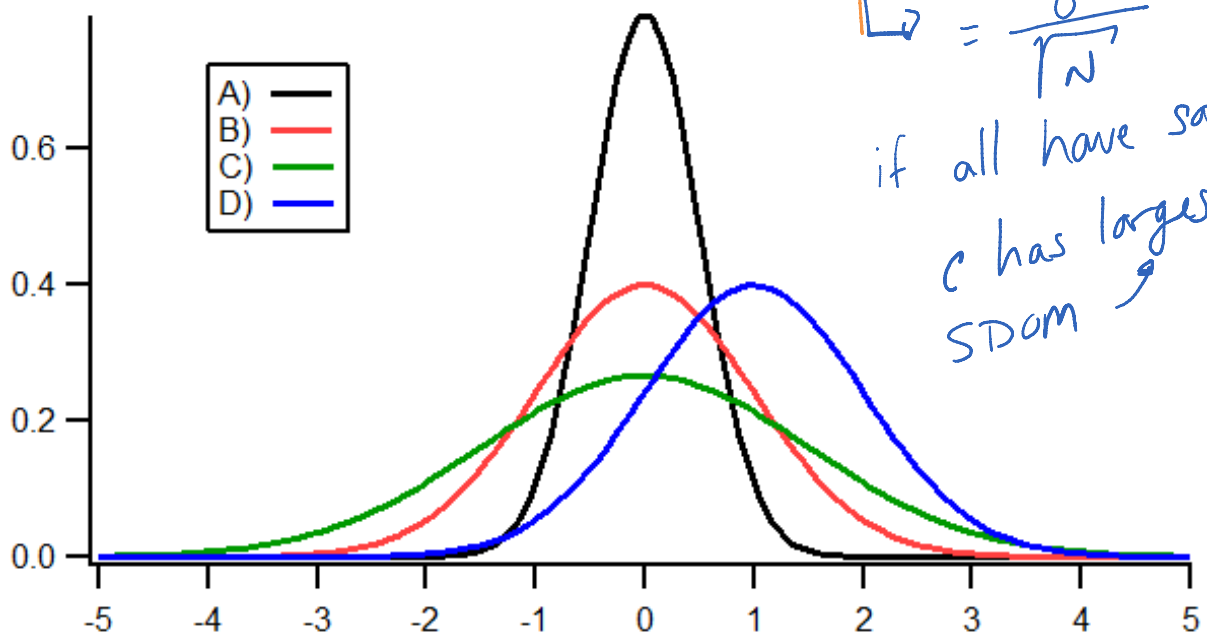
Which distribution has the largest area?



E) They're all the same

Which distribution has the largest standard deviation of the mean?

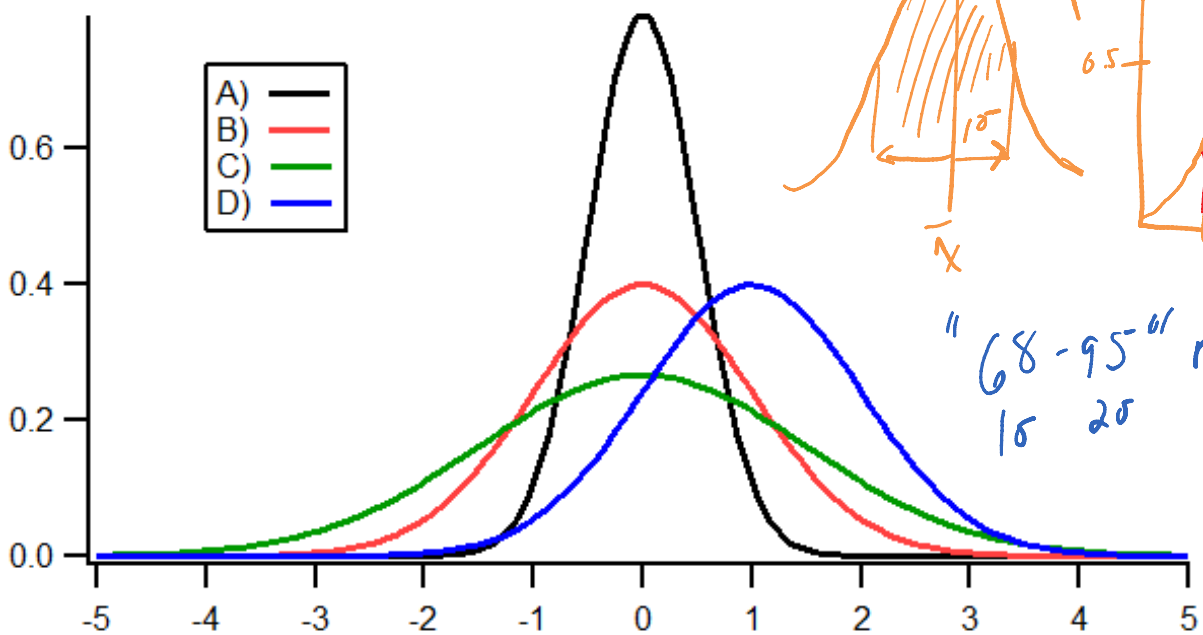
$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{N}}$

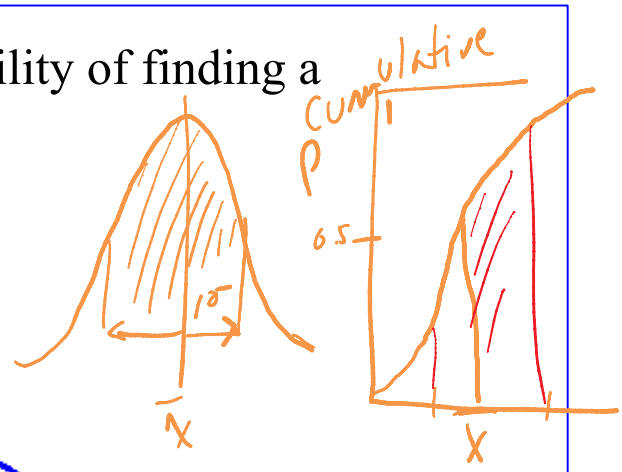


if all have same N, c has largest σ, SDOM

E) Not enough information → w/o an assumption about N

Which distribution has the largest probability of finding a measurement in the range X ± 1σ?





"68-95" rule
1σ 2σ

E) They're all the same

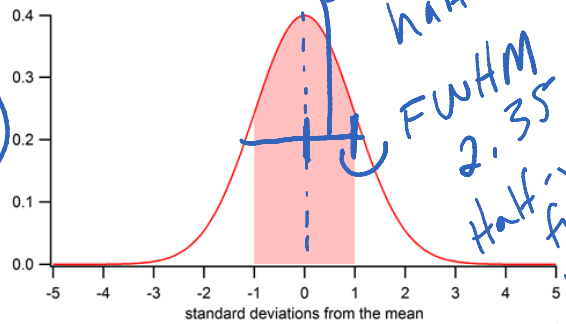
Which graph shows the probability of a measurement in the range **X** ± 1σ?

FWHM | width half maximum

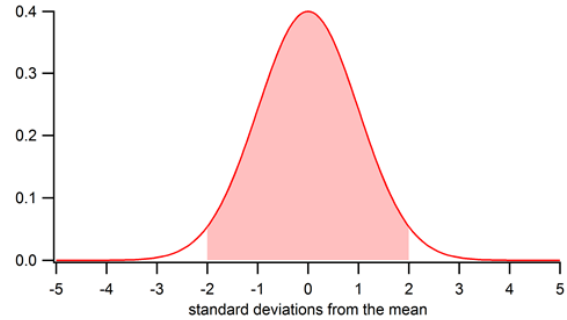
FWHM 2.35σ

half-width full max 1.17σ

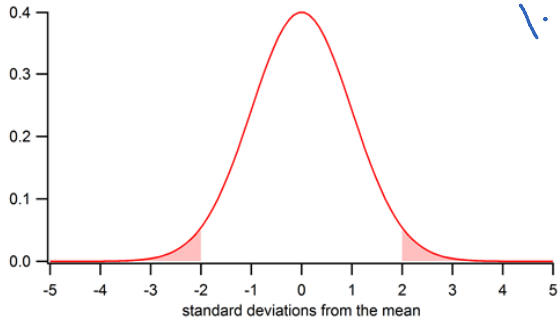
A)



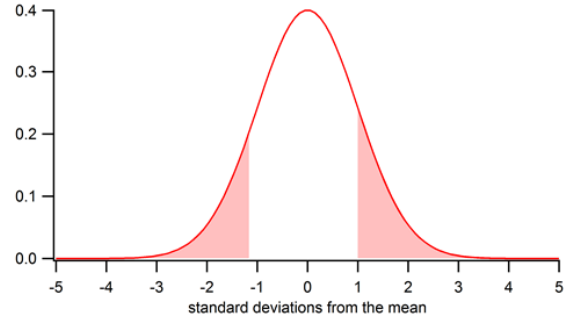
B)



C)

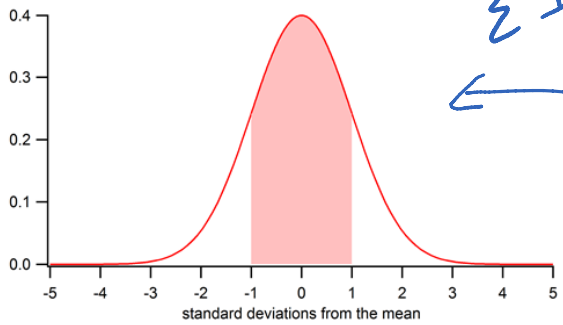


D)

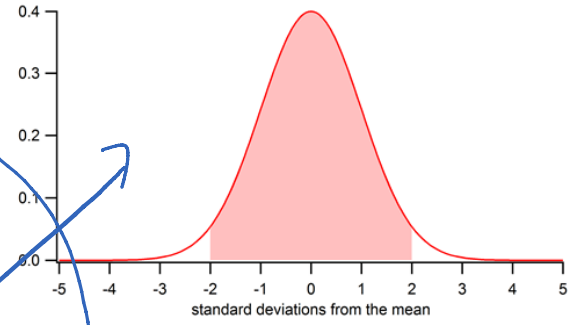


Which graph shows the probability of a measurement in the range **X** >±2σ?

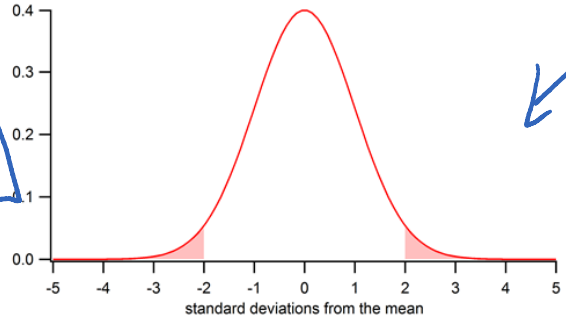
A)



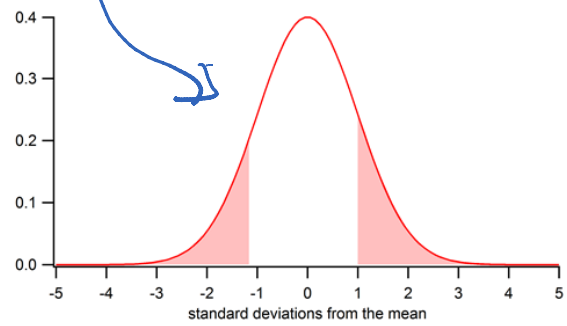
B)



C)



D)



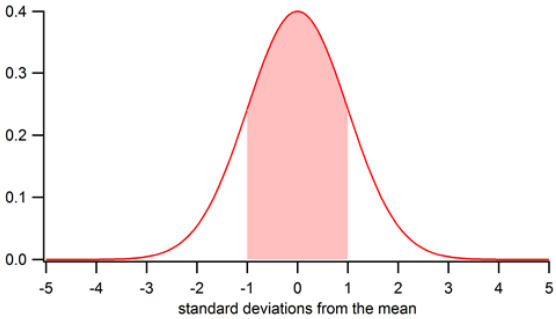
Which graph shows what Taylor's erf(t) calculates for t=2?

cerf(t) = 1 - erf(t) igor $\int_0^t$

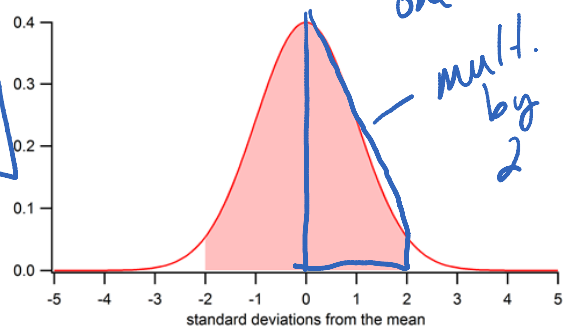
one-sided

mult. by 2

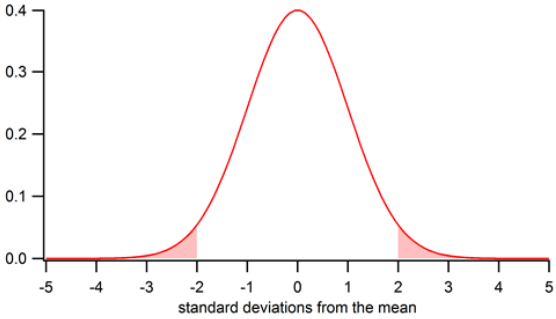
A)



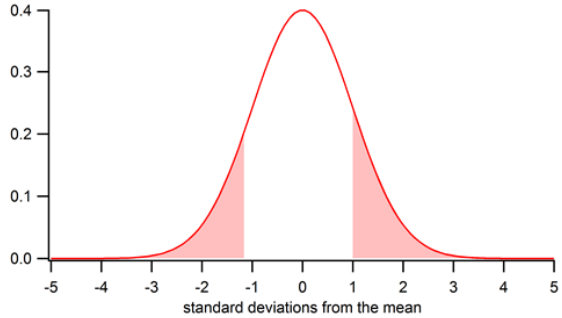
B)



C)

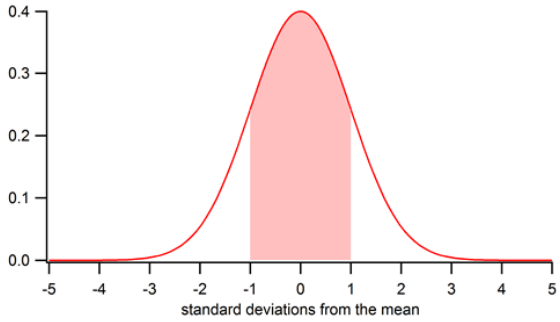


D)

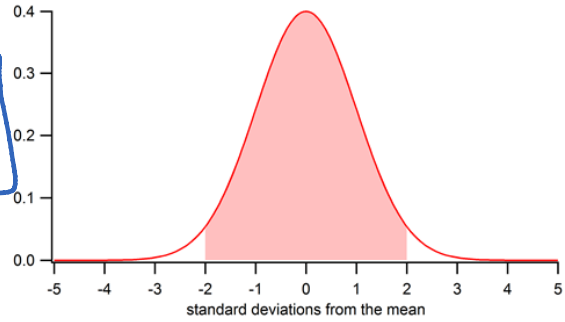


Which graph shows measurements that are statistically significant at the 5% level?

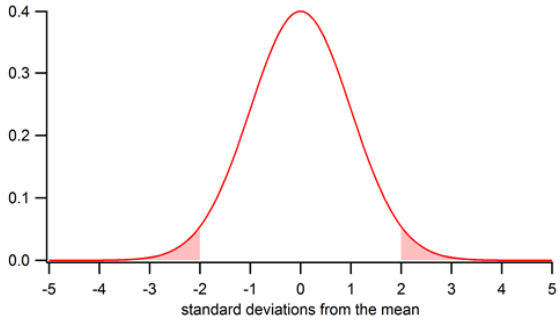
A)



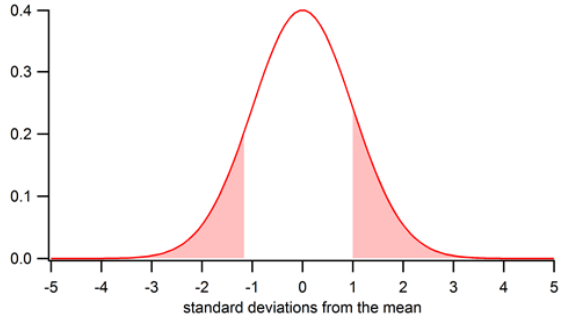
B)



C)



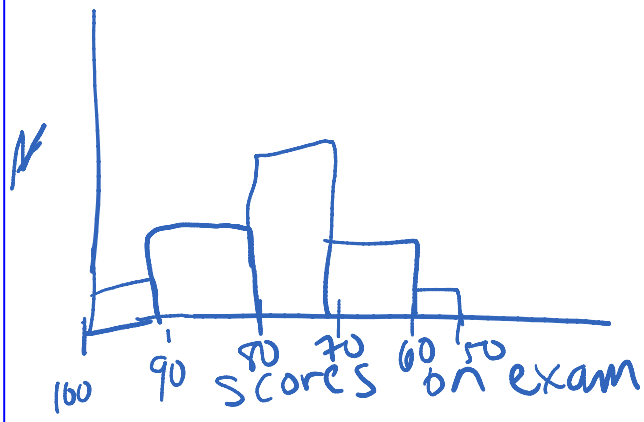
D)



Histograms

Tuesday, September 11, 2012
12:01 PM

What kind of distribution do your data have?

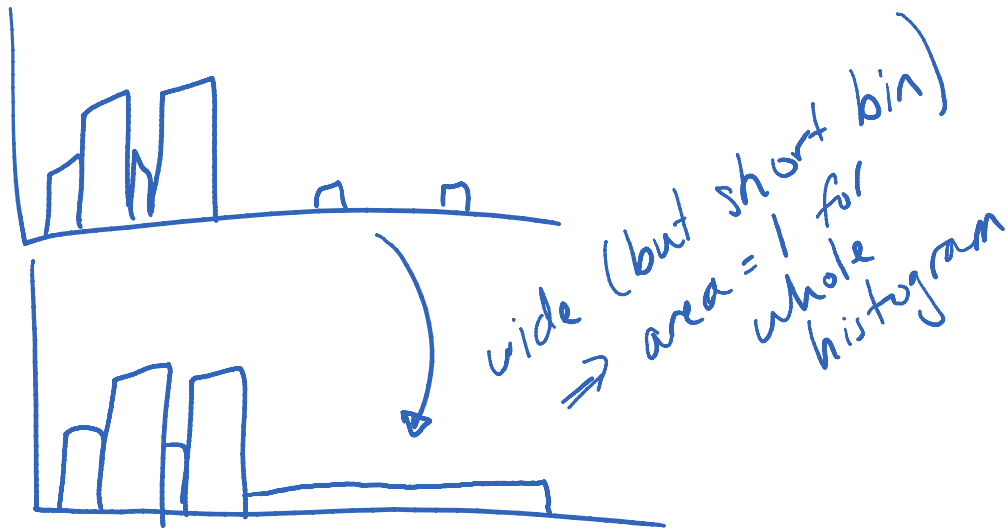


proper histogram
⇒ normalized so
area = 1

histogram (Igor)
* wants a wave to put data (dest wv)

bins in Igor
* width + # bins
* range + # bins
* 2 others statistical bin width calc = function (range, N)

Don't have to have the same bin widths


wide (but short bin)
⇒ area = 1 for whole histogram

Binomial Distr.

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events that do or do not occur w/ some probability

probability for 1 outcome = (# ways you can get that)(prob happens)(prob. doesn't happen)

Toss dice 3 at once

Prob of getting all 6's

6	6	6	> all 6 case — 1
6	6	/	2 6 combos — 3 ways
6	/	6	
/	6	6	
6	/	/	1 6 combos — 3 ways
/	6	/	
/	/	6	
/	/	/	

Pascal's △

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1

Molec. of Br_2

^{79}Br	^{81}Br	mass	
^{79}Br	^{79}Br	= 158	1 way
^{79}Br	^{81}Br	= 160	2 ways
^{81}Br	^{79}Br	= 160	
^{81}Br	^{81}Br	= 162	

$$P(\text{all 6's, 3 dice}) = \underset{\text{way}}{(1)}\left(\frac{1}{6}\right)^3$$

$$P(\text{2 6's, 3 dice}) = (3)\underbrace{\left(\frac{1}{6}\right)^2}_{\text{2 dice are 6}}\left(\frac{5}{6}\right)$$

1 die not 6 $= 1 - \frac{1}{6}$

$$P(\text{1 6's, 3 dices}) = 3\left(\frac{1}{1}\right)\left(\frac{5}{}\right)^2$$

2 dice are 6   1 die not 6 $= 1 - \frac{1}{6}$

$$P(1\ 6\text{'s}, 3\ \text{dices}) = 3\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)^2$$

1 is 6   2 are not 6

$$P(\emptyset\ 6\text{'s}, 3\ \text{dice}) = 1\left(\frac{5}{6}\right)^3$$