Name: _____

Key Topic

Chapter 6

Is about...

Discrete Random Variables

Discrete Whole #s / Gaps in set.

Continuous No gaps / Decimals OK

Valid Distribution

- Each probability is btwn 0 & 1
- Add up to 1

Ex: This is a probability distribution for the number of goals, X, scored in a hockey game.

X	0	1	2	3
Prob.	.2	.25	.35	.20

Find the mean of the distribution and interpret.

$0(.2)+1(.25)+2(.35)+3(.20)=1.55$

After many games, the average # of goals is 1.55.

The standard deviation is 1.023. Interpret this. We expect the # of goals will typically vary by 1.023 from the mean.

Binomial Distribution

BINARY = Success / Failure

Independent

Number of trials $n=$

Same probability $p=$

Formula

$$nC_K \cdot p^K \cdot (1-p)^{n-K}$$

Mean $= n \cdot p$

Standard Deviation $= \sqrt{np(1-p)}$

Ex: Micah is a 52% 3-point shooter. He shoots 8 3-pointers in one game.

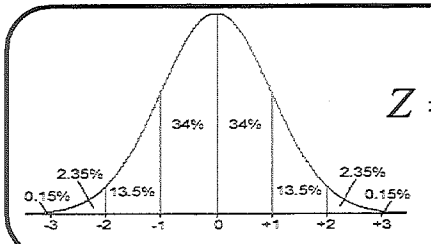
A.) Find the mean and standard deviation. $\mu = 8(.52) = 4.16$

$\sigma = \sqrt{8(.52)(.48)} = 1.41$

B.) What is the probability he makes exactly 5 of the 3-pointers?

$8C_5 (.52)^5 (.48)^3 = .235$

Continuous Random Variables



$$Z = \frac{x - \mu}{\sigma}$$

Ex. If the mean is 30 and the deviation is 10, what is the probability that a value selected is greater than 50?

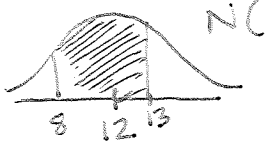
$N(30, 10)$

$P(x > 50) = P\left(z > \frac{50-30}{10}\right)$

$= P(z > 2)$

normalcdf(50, 1E99, 30, 10) ≈ .025

Ex. If the mean is 12 and the deviation is 2.2, what is the probability that a value selected is between 8 and 13?



$N(12, 2.2)$

$P(8 < P < 13)$

$P\left(\frac{8-12}{2.2} < Z < \frac{13-12}{2.2}\right)$

$P(-1.82 < Z < .45)$

normalcdf(8, 13, 12, 2.2) ≈ .639