


Concept: Binomial Probabilities

Name: _____


COMPUTER COMPONENT

Instructions: Select the computer program *Understanding Probability* (Neufeld)
 Follow the instructions to the Main Menu.
 Select *Binomial Probabilities* from the Main Menu.



Work through all sections of the following topics **in order**:

- *Flipping a Coin ... Once*
- *Flipping a Coin ... Twice*
- *Flipping a Coin ... Three Times*
- *Summary*
- *Practice Questions*



As you work through the computer exercises, make your own notes in the **SUMMARY** section of this page.

When you reach the end of the section *Practice Questions* on the computer, move on to the **OFF COMPUTER EXERCISES** below.

SUMMARY

> _____ probabilities occur in any situation where there are ____ possible outcomes.

> _____ diagrams are a helpful tool for outlining all the outcomes for a particular situation.

> *Flipping a Coin*

P(heads) = _____

P(tails) = _____

> *Flipping a Coin Twice*

P(2 heads) = _____

P(1 head) = _____

P(0 heads) = _____

> ***Flipping a Coin Three Times***

Recreate the tree diagram that shows all of the outcomes from flipping a coin three times.

OFF COMPUTER EXERCISES

1. Calculate the following probabilities from the experiment of flipping a coin three times:

(a) $P(0 \text{ heads}) =$

(b) $P(1 \text{ head}) =$

(c) $P(2 \text{ heads}) =$

(d) $P(3 \text{ heads}) =$

2. Now we'll look at all of the numerators in the probabilities that we have studied today.

numerators from 1 toss	1	1		
numerators from 2 tosses	1	2	1	
numerators from 3 tosses	1	3	3	1

Can you predict the numerators that will occur in the row for 4 tosses?

3. Binomial patterns occur in many places. Some students may have experience in multiplying binomial expressions. (If you haven't taken introductory algebra, don't worry ... just apply the patterns that you've learned for now.)

for instance:

$$(a + b)^2 = (a + b)(a + b) = 1a^2 + 2ab + 1b^2$$

Do you recognize the coefficients in the above expression?

Fill in the missing values:

(a) $(x + y)^2 =$

(b) $(a + b)^3 = (a + b)(a + b)(a + b) = \underline{\quad} x^3 + \underline{\quad} x^2 y + \underline{\quad} x y^2 + \underline{\quad} y^3$

(c) $(w + z)^3 =$