RANDOM VARIABLES

A *random variable* is a variable whose numerical values are determined by chance.

A *random variable* is a variable whose numerical values are determined by chance.

A *random variable* is *discrete* if its values do not exist along a continuum. In other words, we think of there being separation between the possible values. Discrete random variables are often the result of a count. Furthermore, our author makes a distinction between *finite (discrete)* and *discrete infinite.*

A *random variable* is a variable whose numerical values are determined by chance.

A *random variable* is *discrete* if its values do not exist along a continuum. In other words, we think of there being separation between the possible values. Discrete random variables are often the result of a count. Furthermore, our author makes a distinction between *finite (discrete)* and *discrete infinite.*

A *random variable* is *continuous* if its values do exist along a continuum. Thus, between any two values of the variable, other possible values exist.

If you flip a coin three times and let X = *number of heads,* then X is a finite random variable with possible values of 0, 1, 2, & 3.

If you flip a coin three times and let *X* = *number of heads,* then *X* is a finite random variable with possible values of 0, 1, 2, & 3.

If you let *X* = *number of eggs a hen lays,* then *that* is, in theory, a discrete infinite random variable.

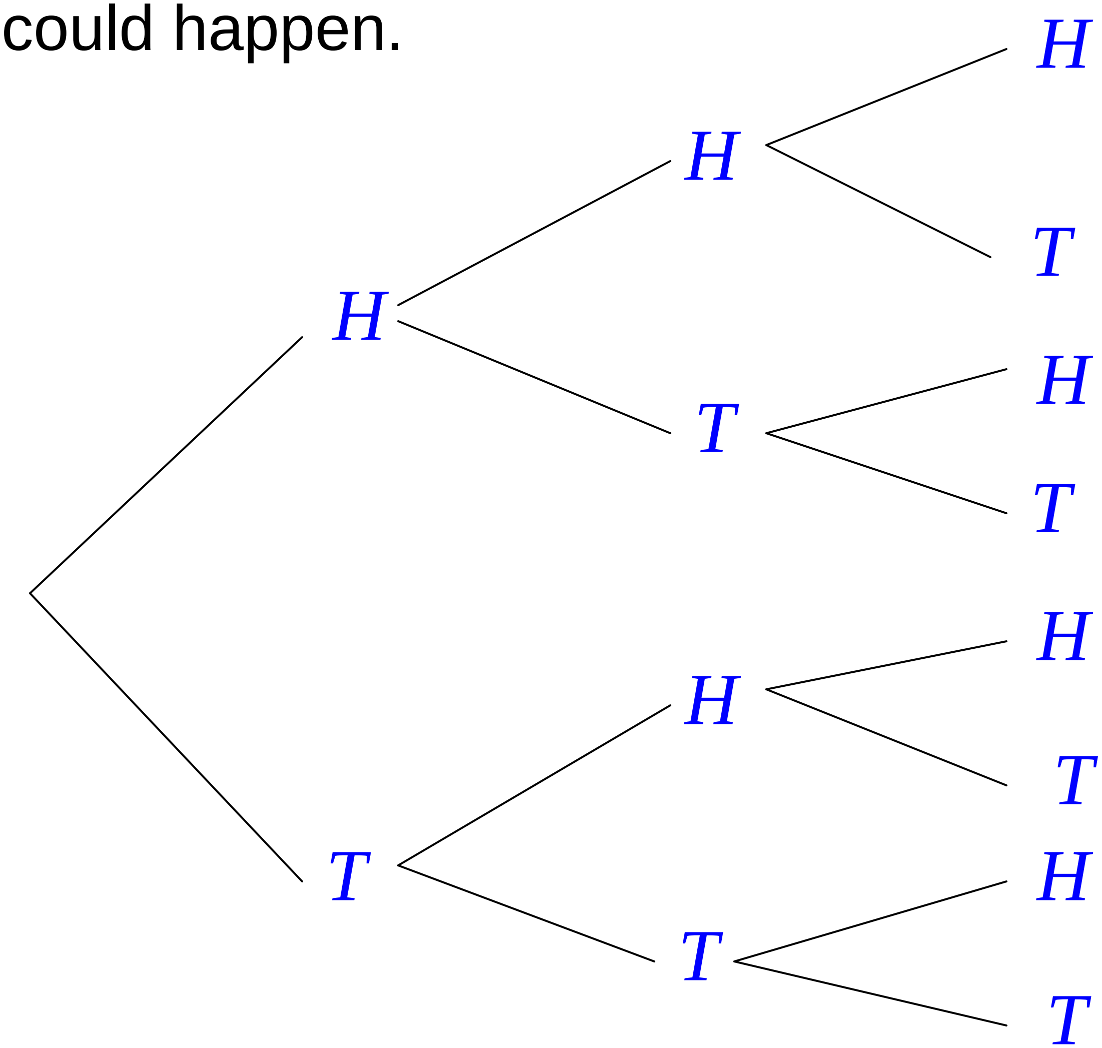
If you flip a coin three times and let X = *number of heads,* then X is a finite random variable with possible values of 0, 1, 2, & 3.

If you let X = *number of eggs a hen lays,* then *that* is, in theory, a discrete infinite random variable.

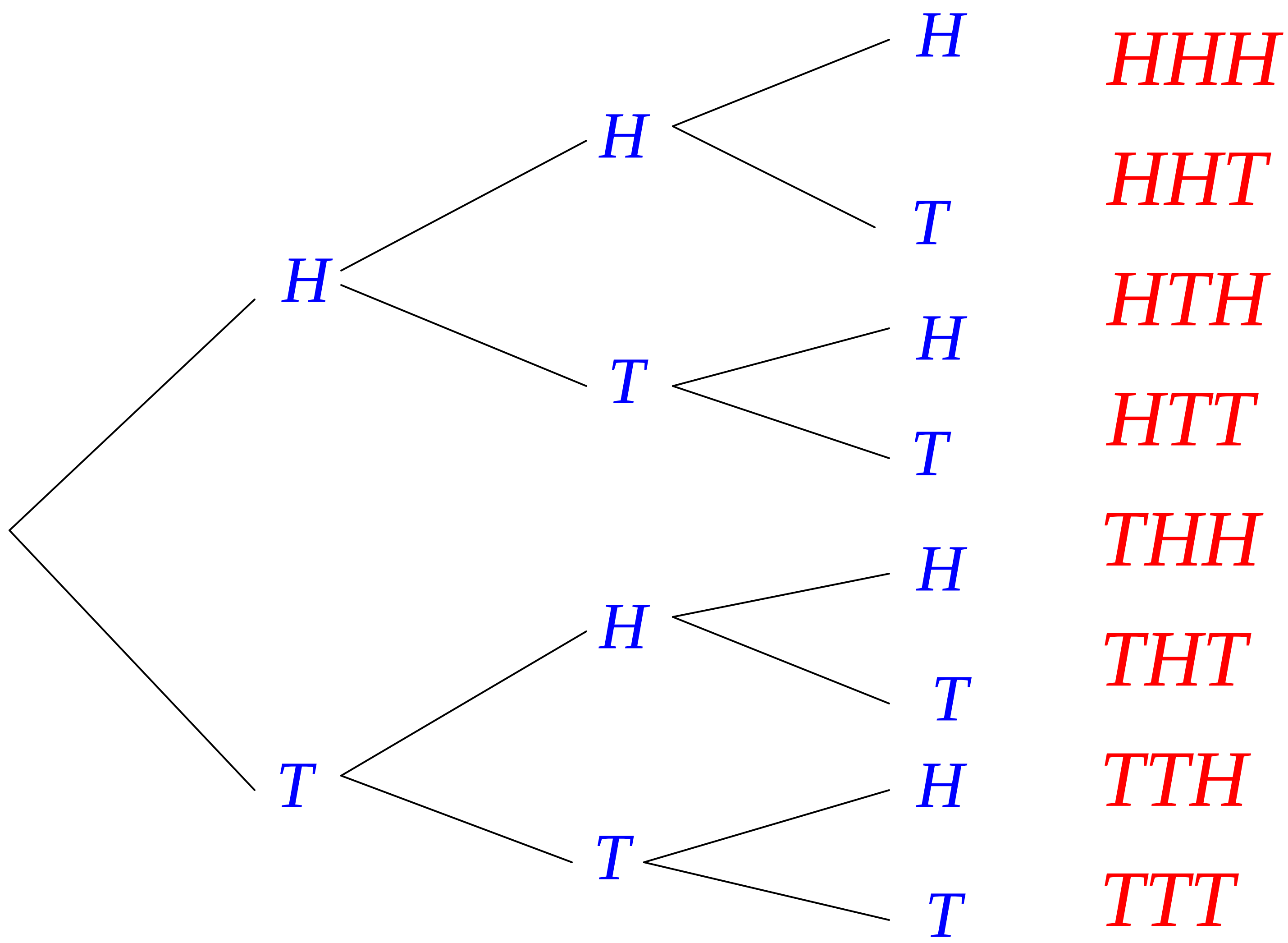
If you let X = *amount of milk a cow produces,* then *that* is a continuous random variable.

Let’s do the experiment where we flip a fair coin three times and let X = *number of heads,* and let’s consider what could happen.

Let's do the experiment where we flip a fair coin three times and let X = *number of heads,* and let's consider what could happen.



There are eight possible outcomes.



We can summarize the results in the following table.

x = number of heads	$P(x)$
0	1/8
1	3/8
2	3/8
3	1/8

HHH

HHT

HTH

HTT

THH

THT

TTH

TTT

This type of table is called a *probability distribution*.

x = number of heads	$P(x)$
0	1/8
1	3/8
2	3/8
3	1/8

HHH

HHT

HTH

HTT

THH

THT

TTH

TTT

Notice, also, the following:

x = number of heads	$P(x)$
0	1/8
1	3/8
2	3/8
3	1/8

HHH

HHT

HTH

HTT

THH

THT

TTH

TTT

1. $0 \le P(x) \le 1$

2. $\sum P(x) = 1$

We can also create a histogram on our calculator for this Probability distribution by completing the following screens:

x = number of heads	$P(x)$
0	1/8
1	3/8
2	3/8
3	1/8

1. $0 \le P(x) \le 1$

2. $\sum P(x) = 1$

HHH

HHT

HTH

HTT

THH

THT

TTH

TTT

We can also create a histogram on our calculator for this Probability distribution by completing the following screens: