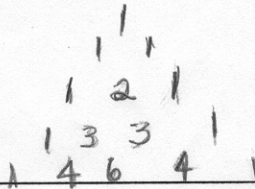Why does the formula 2^n give you the number of all of the possible subsets for a set with n elements in it?

The # of subsets is modeled by Pascal's triangle, where there is the set itself, different combinations of subsets with one less element than the maximum, ..., until the final subset is the ∅.

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

Universal Set: The set of **all** elements you are allowed to consider as possible elements for your sets within a particular problem. The universal set can change when you change problems. Again, it is a matter of being precise. What are you allowed to use and what are you not allowed to use to solve the problem? The universal set is designated set **U**.

Class Exercise 7: Solve these equations using the given universal sets.

a. If U = the set of whole numbers, then what is the solution set for $x < 3$?

$\{0, 1, 2\}$

b. If U = $\{2, 4, 6, 8, 10\}$, then what is the solution set for $x < 3$?

$\{2\}$

c. If U = $\{0, 1\}$, then what is the solution set for $1 + 1 = x$?

$\{\ \}$

d. If U = $\{ \ldots -3, -2, -1, 0, 1, 2, 3, \ldots \}$, then what is the solution set for $x^2 = 9$?

$\{-3, 3\}$