Four Forms of Categorical Propositions

A: All Fs are Gs. $\land x(Fx \rightarrow Gx)$
E: No Fs are Gs. $\land x(Fx \rightarrow \neg Gx)$
I: Some Fs are Gs. $\lor x(Fx \land Gx)$
O: Some Fs are not Gs. $\lor x(Fx \land \neg Gx)$

Contradictories: Cannot both be true and cannot both be false.

Contraries: Cannot both be true but may both be false.

Subcontraries: Cannot both be false but may both be true.

(Aristotle, De Interpretatione, Book 7)

(N.B. If P and Q are contraries, then $\neg P$ and $\neg Q$ are subcontraries, and vice versa.)

Exs.

Everyone is happy. Someone is not happy.
Contradictories.

This piece of chalk is red. This (same) piece of chalk is blue.
Contraries

Some will pass. Some will not pass.
Subcontraries.

Square of Opposition

(Assumes that $\lor xFx$)

```
\land x(Fx \rightarrow Gx): A    \lor x(Fx \land Gx): I
\downarrow   \downarrow
\land x(Fx \rightarrow \neg Gx): E    \lor x(Fx \land \neg Gx): O
```

Subcontraries

where $\lt$ diagonals connect contradictories (even if $\neg \lor xFx$)