1 Prime equation numbers

First an equation.

$$A = B \tag{1.1}$$

That was equation (1.1).

Then the same, with a prime on the number.equation.1.1

$$C = D \tag{1.1$'$}$$

And that was equation (1.1′).

Notice, by the way, that when a `\ref` occurs inside a `\tag`, and that `\tag` is then `\label`'d, a `\ref` for the second `\label` requires *three* runs of LaTeX in order to get the proper value. (If you run through the logic of LaTeX's cross-referencing mechanisms as they apply in this case, you will see that this is necessary.)

2 Subnumbered equations

Here is a,b,c sub-numbering.

$$A = B \tag{2.1a}$$
$$D = C \tag{2.1b}$$
$$E = F \tag{2.1c}$$

That was produced with the `eqnarray` environment; the middle line was labeled as (2.1b).

An equation following the end of the `subequations` environment should revert to normal numbering:

$$H < K \tag{2.2}$$

A check on the labeling: that was equation (2.2).

The sub-numbered equations can be spread out through the text, like this:

$$A = B \tag{2.3a}$$

The `subequations` environment can span arbitrary text between subsidiary equations. The only restriction is that if there are any numbered equations inside the `subequations` environment that break out of the subequation numbering sequence, they would have to be handled specially.

$$D = C \tag{2.3b}$$

More arbitrary text.

$$E = F \tag{2.3c}$$

Label check: the middle one was (2.3b)

A final equation for a numbering check.

$$G = H \tag{2.4}$$

That equation was labeled as (2.4).

3 Tests of `align`, `gather`, and other AMS-LaTeX environments

The `align` environment:

$$A + B = B + A \tag{3.1a}$$
$$C = D + E \tag{3.1b}$$
$$E = F \tag{3.1c}$$

Label check: that was (3.1a), (3.1b), and (3.1c).

The `align` environment again:

$$A + B = B \qquad B = B + A \tag{3.2a}$$
$$C = D + E \qquad C \oplus D = E \tag{3.2b}$$
$$E = F \qquad E' = F' \tag{3.2c}$$

Label check: that was (3.2a), (3.2b), and (3.2c).

The `gather` environment. For the third line we refer to one of the numbers in the first `align` structure.

$$A + B = B \tag{3.3a}$$
$$C = D + E \tag{3.3b}$$
$$E = F \tag{3.1c$'$}$$

Label check: that was (3.3a), (3.3b), and (3.1c$'$).

The next `subequations` environment encompasses two separate equations. A `split` environment:

$$\begin{aligned} A &= B + C + F \\ &= G \end{aligned} \tag{3.4a}$$

and a `multline` environment:

$$\begin{aligned} A[B]C[D]E[F]G[[H[I]J[K]L[M]N]] = \\ H[I]J[K]L[M]N[O]P[Q]R[S]T[U]V[W]X[Y]Z \end{aligned} \tag{3.4b}$$

Label check: That was (3.4a) and (3.4b).