The perverse timing of stepping the equation counter

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1 Equations

Note how equations increment the equation counter at the *beginning*, even if later on, the equation tag is removed or set explicitly!

Normal (w/eq=0)

$$N = 1 \tag{1}$$

Nonumber before (w/eq=1)

$$N = 1$$

Nonumber after (w/eq=1)

$$N = 2$$

Numbered, Tag before (w/eq=1)

$$N = 1 \tag{1′}$$

Numbered, Tag after (w/eq=1)

$$N = 2 \tag{1″}$$

Other variations:

$$N = 2 \qquad (1 \texttt{ primed})$$

$$N = 2 \qquad (1 \text{ in text})$$

UnNumbered (w/eq=1)

$$N = 1$$

UnNumbered, Tag before (w/eq=1)

$$N = 1 \tag{1‴}$$

UnNumbered, Tag after (w/eq=1)

$$N = 1 \tag{1⁗}$$

Now (w/eq=1).

2 Eqnarrays

Note how eqnarrays *also* increment at the beginning! *Even* eqnarray*!

Mostly numbered, unnumbered before and after (w/eq=1)

$$N = 2 \tag{2}$$
$$N = 3 \tag{3}$$
$$N = 4$$
$$N = 4$$
$$N = 4 \tag{4}$$

Unnumbered (w/eq=4)

$$N = 5$$
$$N = 5$$

Now (w/eq=4).

3 AMS alignments

However, note how AMS alignments *defer* incrementing the equation counter until the end of line mark!

Align numbered, some unnumbered before, after, some tagged before, after (w/eq=4)

$$N = 4 \tag{5}$$
$$N = 5 \tag{6}$$
$$N = 6$$
$$N = 6$$
$$N = 6 \tag{7}$$
$$N = 7 \tag{7'}$$
$$N = 7 \tag{7''}$$

Align numbered, some tagged before, after (w/eq=7)

$$N = 7$$
$$N = 7 \tag{7'''}$$
$$N = 7 \tag{7''''}$$
$$N = 7$$

Now (w/eq=7).