To produce the trivial

$$\frac{a+b}{2c} = 1$$

the following EQN syntax suffices:

```
.EQ
a+b over 2c = 1
.EN
```

To produce the not quite so trivial:

$$\frac{\alpha+\beta}{\sin(x)}$$

the following naive EQN syntax fails:

```
.EQ
alpha + beta over sin (x)
.EN
```

because it yields

$$\alpha + \frac{\beta}{\sin}\,(x)$$

In this example, the EQN text of numerator is

```
alpha + beta
```

But because "sin" needs spaces around it so that it gets treated as special, that of the denominator is

```
sin (x)
```

Having blanks in the mix mandates the embracing of both numerator and denominator. So, the fraction will need to be written as

```
.EQ
{ alpha + beta } over { sin (x) }
.EN
```

The space to the left of **alpha** and **sin**, and to the right of **beta** and **(x)** are redundant because braces are perfectly legitimate separators (§6).

A more extravagant embraced example is:

```
.EQ
Z ~ = ~~ U over V
  ~~   ~~ { a + b X } over { c + d X }
.EN
```

This yields:

$$Z = \frac{U}{V} = \frac{a+bX}{c+dX}$$

Un-embraced, that example would have been:

```
.EQ
Z ~ = ~~ U over V
  ~~ =   ~~ a + b X over c + d X
.EN
```

This yields the very different result:

$$Z = \frac{U}{V} = a + b\,\frac{X}{c} + dX$$

To avoid ambiguity, when there is an **over** and a **sup** (or a **sub**) in the same expression, operations with the same precedence, **eqn** does the **sup** (or the **sub**) before the **over**. Hence the expression:

```
-b sup 2 over pi
```

yields $\frac{-b^2}{\pi}$ instead of $-b^{\frac{2}{\pi}}$. Use braces for clarity!

In the absence of embracing, and except for the case in the previous paragraph, the precedence order that decides which operation is done first in cases like this are given in §DGM.

GNU's **eqn** provides **smallover** as an alternative to the ***keyword*** **over**. It sets the numerator and denominator in a smaller type and puts them closer to the horizontal line in the fraction (Appendix B).

9. Square Roots, etc

To produce a square root expression like

$$\sqrt{\beta}$$

one uses the EQN syntax that reflects how it reads:

```
.EQ
sqrt beta
.EN
```

As with **sup** and **sub**, and as seen in the above, the ***keyword*** **sqrt** that square root sign appears only over the single thing that follows it. So

```
.EQ
sqrt X + Y
.EN
```

yields ... $\sqrt{X} + Y$. This is misleading even if it is strictly correct.

To produce the notationally correct square root of an expression with multiple things, $X + Y$, these things must be embraced to create a single thing so it is suitable for **sqrt**. Hence for the expression $X + Y$, its square root would be written as:

```
.EQ
sqrt { X + Y }
.EN
```

to yield $\sqrt{X+Y}$.

A square root sign is automatically drawn of the appropriate length (and height) to cover the entirety of the thing to which it applies. As will be seen shortly, that it not always visually perfect.