Programming the Casio fx-9750/9860 REM/MOD

Note Title 2014-08-08

Remainders and Modulus are similar but different. They both deal with remainders and have identical results when dividing positive numbers. However, the results are different when the dividend is negative. Generally, the divisor is never negative with modulus. You can think of modulus as giving you a circular answer. You use this more than you think but have never been given a proper definition.

eg) What is the day of the week 18 days before Monday? Let Sunday = 0 and Saturday = 6, so Monday = 1. 18 days ago = -17, to make this positive, we add 21 days which is 3 full weeks and we get 4, this is Thursday.

eg) What time is 6 ½ hours before 1:15 pm?
1:15 = 1 ¼
So, $12 - 6\frac{1}{2} + 1\frac{1}{4} = 12\frac{5}{4} - 6\frac{2}{4} = 6\frac{3}{4} \equiv 6{:}45$ am.

Anything that is circular and we want a positive result, we will most likely need modulus. Another math application is finding the Principal Angle in Trigometric Functions.

```
0 ======REM      ======
1 "D"?→D↵
2 "Q"?→Q↵
3 "R"↵
4 D-QxInt (D÷Q)→R↵
```

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```
0 ======MOD      ======
1 "B "?→B↵
2 "N "?→N↵
3 "A"↵
4 B-NXInt₰ (B÷N)→A
```

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Looking at the first example of the days of the week. Our divisor is 7 because the week has 7 days.

```
D?
-17
Q?
7
R
```

-3

Count backwards 3 days from Sunday. ← You just have to remember to count backwards.

```
B ?
-17
N ?
7
A
```

4

Just use table.

So MOD is an easier function to use.

Let's look at the second example with the clock. The divisor is 12 because we have 12 hours on the clock.

```
D?
1.25-6.5+12
Q?
12
R
```

6.75

6 + ¾ hour ≡ 6:45 am.

```
B ?
1.25-6.5
N ?
12
A
```

6.75

We get the same answer as MOD, but we have to make the dividend positive to do this.

Again, it's easier to use MOD because we don't have to remember to make the dividend positive.