#16: Let $p = p_0 + p_1 x + \dots + p_n x^n \in R^+$

$q = q_0 + q_1 x + \dots + q_m x^m \in R^+$

Assume the first nonzero coeff of p is $p_i > 0$

— " — q is $q_j > 0$

(a),(b) if $i = j$ then the 1st nonzero coeff of $p+q$ is $p_i + q_i > 0$
(coeff of x^i)

the 1st nonzero coeff of pq is $p_i q_i > 0$
(coeff of x^{2i})

if $i > j$ then the 1st nonzero coeff of $p+q$ is $0 + q_j = q_j > 0$
(coeff of x^j)

the 1st nonzero coeff of pq is $p_i q_j > 0$
(coeff of x^{i+j})

if $i < j$: analogously ---- $p+q$: $p_i + 0 = p_i > 0$

----- pq : $p_i q_j > 0$

(c) If all coeffs are 0: $p = 0$

If one at least is $\neq 0$, take the first $\neq 0$ coeff. p_i: if it's > 0, then $p \in R^+$ by definition. If it's < 0, then the corresponding coeff of $-p$ is $-p_i$, which is positive since $p_i < 0$.

Hence $-p \in R^+$ CONTINUED NEXT PAGE

#20:

$$\left.\begin{aligned} 1 \cdot A &= A \\ 2 \cdot A &= A + A = \emptyset \\ 3 \cdot A &= 2 \cdot A + A = \emptyset + A = A \end{aligned}\right\}$$

etc.

The pattern prevails for negative integers since $(-n)A = -(nA) \underset{\uparrow}{=} nA$

in $\mathcal{P}(M)$, any set is its own additive inverse

$$\boxed{\begin{aligned} &\underline{\text{So:}}\ \text{If } n \text{ is odd, then } nA = A \\ &\quad\ \text{If } n \text{ is even, then } nA = \emptyset \end{aligned}}$$