388 For each of the following construction axioms, use recursive construction to find the first few elements, and then guess what *what* is.

(a) $1, what+what, what \times what: what$

(b) $2, what+what, what \times what: what$

After trying the question, scroll down to the solution.

(a) $1, what{+}what, what{\times}what: what$

§ $what_0 = null$

$what_1 = 1, null{+}null, null{\times}null = 1$

$what_2 = 1, 1{+}1, 1{\times}1 = 1, 2$

$what_3 = 1, (1, 2){+}(1, 2), (1, 2){\times}(1, 2) = 1, 2, 3, 4$

I guess $what = nat{+}1$

(b) $2, what{+}what, what{\times}what: what$

§ $what_0 = null$

$what_1 = 2, null{+}null, null{\times}null = 2$

$what_2 = 2, 2{+}2, 2{\times}2 = 2, 4$

$what_3 = 2, (2, 4){+}(2, 4), (2, 4){\times}(2, 4) = 2, 4, 6, 8, 16$

I guess $what = 2{\times}(nat{+}1)$