Errata for Transition to Higher Mathematics: Structure and Proof

p. 47, Exercise 1.30 (iii): Should be ⟨2, 1, 10, 27, 66, 125, 218, . . .⟩

p. 71, Exercise 2.24: The second line should have “x, y ∈ R”, so that the whole exercise should read:

“Let X = {⌜n⌝ | n ∈ N}. Let R be a relation on X defined by x, y ∈ R iff x ⊆ y. Prove that R is a linear ordering.”

p. 164 Figure 6.1: The bottom line of the picture (mapping m+1 to m+1) should be deleted, and the top should start with mapping 0 to 0.

pp. 168-169, proof of Theorem 6.3.

The definitions of X_e, X_o, X_i and Y_e, Y_o, Y_i are wrong. When counting antecedents, we have to count every time an element appears in a chain of predecessors.

So, given an element w, let m(w) be 0 if w does not have a predecessor. Otherwise, let m(w) be the maximum number N ≥ 1 such that there is a finite sequence ⟨z_n | 0 ≤ n ≤ N⟩ for some N ≥ 1 satisfying

1. w = z_N
2. For n < N, z_n is the predecessor of z_{n+1},

if the maximum exists. If the maximum doesn’t exist (i.e. if one can make arbitrarily long chains of predecessors), let m(w) = ∞.

Now define

X_e = {x ∈ X | m(x) is even}
X_o = {x ∈ X | m(x) is odd}
X_i = {x ∈ X | m(x) = ∞}
Y_e = {y ∈ Y | m(y) is even}
Y_o = {y ∈ Y | m(y) is odd}
Y_i = {y ∈ Y | m(y) = ∞}

With these definitions, the function F defined on the middle of page 169 is a bijection, with the proof as given on the next two pages.

p. 196, Proof of Proposition 7.1: First line should be:

“Let c > 1 be a common factor of b and a − b.”