Errata for Transition to Higher Mathematics: Structure and Proof

p. 47, Exercise 1.30 (iii): Should be $\langle 2, 1, 10, 27, 66, 125, 218, \dots \rangle$

p. 71, Exercise 2.24: The second line should have "$x, y \in R$", so that the whole exercise should read:

"Let $X = \{\ulcorner n \urcorner \mid n \in \mathbb{N}\}$. Let R be a relation on X defined by $x, y \in R$ iff $x \subseteq y$. 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 $N \geq 1$ such that there is a finite sequence $\langle z_n \mid 0 \leq n \leq N \rangle$ for some $N \geq 1$ 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 $m(w) = \infty$.

Now define

$$\begin{aligned} X_e &= \{x \in X \mid m(x) \text{ is even}\} \\ X_o &= \{x \in X \mid m(x) \text{ is odd}\} \\ X_i &= \{x \in X \mid m(x) = \infty\} \\ Y_e &= \{y \in Y \mid m(y) \text{ is even}\} \\ Y_o &= \{y \in Y \mid m(y) \text{ is odd}\} \\ Y_i &= \{y \in Y \mid m(y) = \infty\} \end{aligned}$$

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 $a - b$."