8.

$$P'10 \longrightarrow P10$$

Let a be any number and b = 0. Then by P'10, we obtain P10:

Let P denote the positive numbers. For any number a, one and only one of the following holds:

- (i) a = 0
- (ii)  $0 < a \Longrightarrow a$  is in the collection P
- (iii)  $a < 0 \Longrightarrow -a > 0 \Longrightarrow -a$  is in the collection P

## $P'11 \land P'12 \longrightarrow P11$

Let a and b be any numbers such that 0 < a and 0 < b. By P'12,  $(0 < a) \Longrightarrow (0 + b < a + b)$ . By P'11, (0 < b) and  $(a + b) \Longrightarrow (0 < a + b)$ , so we obtain P11:

Let P denote the positive numbers. If a and b are in the collection P, then a + b is in P.

$$P'13 \longrightarrow P12$$

Let a and b be any numbers such that 0 < a and 0 < b. By P'13,  $0(b) < a(b) \Longrightarrow 0 < ab$ . Thus we obtain P12:

Let P denote the positive numbers. If a and b are in the collection P, then ab is in P.