$\text{MODULE } appex4\_13$

EXTENDS *Naturals*

VARIABLES $x,\ y,\ pc$

Define actions from the text of annotated algorithm
$al1l2 \;\triangleq$
$\quad \land\ pc = \text{``l1''}$
$\quad \land\ pc' = \text{``l2''}$
$\quad \land\ x' = 2 * y$
$\quad \land\ y' = y$

Define the computation relation
$next \;\triangleq\; al1l2\ \lor \text{UNCHANGED}\ \langle x,\ y,\ pc \rangle$
Define the initial conditions
$init \;\triangleq\; pc = \text{``l1''} \land x = 1 \land y = 12$

Define the invariant from the annotation
$i \;\triangleq$
$\quad \land\ pc = \text{``l2''} \Rightarrow x = 1 \land y = 24$
$\quad \land\ pc = \text{``l1''} \Rightarrow x = 1 \land y = 12$
Define the safety property to check namely the partial correctness

$Init \;\triangleq\; init$
$Next \;\triangleq\; next$