Software Verification  
Exercise: Software Model Checking

Consider the following routine:

```plaintext
always_positive (x: INTEGER): INTEGER
    if x > 0 then
        Result := x + x
    else
        if x = 0 then
            Result := 1
        else
            Result := x * x
        end
    end
ensure Result > 0 end
```

Questions:

(a) Build a predicate abstraction of `always_positive` with respect to \( \Pi = \{\text{pos}, \text{Rpos}\} \). The predicates pos and Rpos correspond to the expressions \( x > 0 \) and `Result > 0` respectively.

(b) Can you verify the abstraction obtained in (a)? If not, give a counterexample path and prove whether or not it is necessarily spurious.