Ex 2

prove that $wp(P, [F]) = [wp(P, F)]$

Proof by structural induction

base cases

① "skip" $wp(skip, [F]) = [wp(skip, F)]$

$[F] = [F]$

② "diverge" $wp(diverge, [F]) = [wp(diverge, F)]$

$\lambda s.\ 0 = [false]$

$\lambda s.\ 0 = \lambda s.\ 0$

③ "assignment" $wp(x := E, [F]) = [wp(x := E, F)]$

$\lambda s.\ [F][x := E] = \lambda s.\ [F[x := E]]$

case $F(s) = true$:

$1 \cdot [x := E] = [true\ [x := E]]$

$[x := E] = [x := E]$

case $F(s) = false$:

$0 \cdot x := E = [false\ [x := E]]$

$0 = [false]$

$0 = 0$

Induction Hypothesis: (any arbitrary)

Suppose we know that for programs P and Q

we know that $wp(P, [E]) = [wp(P, F)]$

and $wp(Q, [F]) = [wp(Q, F)]$ hold.