```
mul_via_intseg_factors  THM

⊢  ∀a,b:ℤ, f,g:({a..b⁻}→ℤ).
|  (Π i:{a..b⁻}. f(i))•(Π i:{a..b⁻}. g(i)) = (Π i:{a..b⁻}. f(i)•g(i))
| by Inst:
|    Thm*  ∀f:(A→A→A), u:A.
|          is_commutative_sep(A; f)
|          ⇒
|          is_ident(A; f; u)
|          ⇒
|          is_assoc_sep(A; f)
|          ⇒
|          (∀a,b:ℤ, e,g:({a..b⁻}→A).
|           f((Iter(f;u) i:{a..b⁻}. e(i)),Iter(f;u) i:{a..b⁻}. g(i))
|           =
|           (Iter(f;u) i:{a..b⁻}. f(e(i),g(i)))
|           ∈ A)
|    {iter_via_intseg_comp_binop}
|    Using:[ℤ | λx,y. x•y | 1]
|
|\
| .....antecedent .....
| ⊢  is_commutative_sep(ℤ; (λx,y. x•y))
|   by Thm*  is_commutative_sep(ℤ; (λx,y. x•y))
|      {is_commutative_sep_intmul}
|      Asserted
|
|\
| .....antecedent .....
| ⊢  is_ident(ℤ; (λx,y. x•y); 1)
|   by Thm*  is_ident(ℤ; (λx,y. x•y); 1)    {intmul_ident_one}
|      Asserted
|
|\
| .....antecedent .....
| ⊢  is_assoc_sep(ℤ; (λx,y. x•y))
|   by Thm*  is_assoc_sep(ℤ; (λx,y. x•y))    {is_assoc_intmul}
|      Asserted
|
.\
. 1. ∀a,b:ℤ, e,g:({a..b⁻}→ℤ).
.    (λx,y. x•y)((Π i:{a..b⁻}. e(i)),Π i:{a..b⁻}. g(i))
.    =
.    (Π i:{a..b⁻}. (λx,y. x•y)(e(i),g(i)))
. ⊢  ∀a,b:ℤ, f,g:({a..b⁻}→ℤ).
.    (Π i:{a..b⁻}. f(i))•(Π i:{a..b⁻}. g(i))
.    =
.    (Π i:{a..b⁻}. f(i)•g(i))  by Reduce Hyp:-1
END
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