depthfirst-properties  THM

```
⊢  For any graph
|  ∀the_obj:GraphObject(the_graph).
|  paren(V;depthfirst(the_obj))
|  & no_repeats(V+V;depthfirst(the_obj))
|  & df-traversal(the_graph;depthfirst(the_obj))
|  & depthfirst-traversal(the_graph;depthfirst(the_obj))
|  & (∀i:V.
|     (inr(i) ∈ depthfirst(the_obj)) & (inl(i) ∈ depthfirst(the_obj)))
| by (RepeatFor 2 (Analyze 0))
|    THEN
|    (Inst
|     Thm* For any graph
|          ∀the_obj:GraphObject(the_graph), i:V.
|          (inr(i) ∈ depthfirst(the_obj))
|          & (inl(i) ∈ depthfirst(the_obj))
|     {depthfirst_member}
|     [the_graph;the_obj])
|    THEN
|    (Inst
|     Thm* For any graph
|          ∀the_obj:GraphObject(the_graph).
|          paren(V;depthfirst(the_obj))
|          & no_repeats(V+V;depthfirst(the_obj))
|     {depthfirst_paren}
|     [the_graph;the_obj])
|    THEN
|    (Inst
|     Thm* For any graph
|          ∀the_obj:GraphObject(the_graph).
|          df-traversal(the_graph;depthfirst(the_obj))
|     {depthfirst_DASH_df_DASH_traversal}
|     [the_graph;the_obj])
|    THEN
|    ExRepD
|    THEN
|    (RepeatFor 4 ((Analyze 0) THEN (Try Trivial)))
|    THEN
|    (BackThru
|     Thm* ∀G:Graph.
|          (∀x,y:Vertices(G). Dec(x = y))
|          ⇒
|          (∀s:traversal(G).
|           paren(Vertices(G);s)
|           ⇒
|           no_repeats(Vertices(G)+Vertices(G);s)
|           ⇒
|           df-traversal(G;s) ⇒ depthfirst-traversal(G;s))
|     {paren_DASH_df_DASH_traversal})
|
.....decidable? .....
1. the_graph : Graph
2. the_obj : GraphObject(the_graph)
3. ∀i:Vertices(the_graph).
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   (inr(i) ∈ depthfirst(the_obj)) & (inl(i) ∈ depthfirst(the_obj))
4. paren(Vertices(the_graph);depthfirst(the_obj))
5. no_repeats(Vertices(the_graph)+
   Vertices(the_graph);depthfirst(the_obj))
6. df-traversal(the_graph;depthfirst(the_obj))
7. x : Vertices(the_graph)
8. y : Vertices(the_graph)
⊢  Dec(x = y)
  by Using [‘the_obj’,the_obj]
     (BackThru
      Thm* For any graph
           ∀the_obj:GraphObject(the_graph), x,y:V. Dec(x = y)
      {decidable__equal_gr_v})
END
```