

# card[clock[x]]

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```
In[1]:= SetDirectory["1:"]; << goedel.09nov09a; << tools.m

:Package Title: goedel.09nov09a          2009 November 9 at 10:50 p.m.

It is now: 2009 Nov 10 at 15:13

Loading Simplification Rules

TOOLS.M                                Revised 2009 November 2

weightlimit = 40
```

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## summary

The cardinality of **clock[x]** is **nat[x]**. As a corollary it follows that the function **CLOCK** is one-to-one.

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## derivation

Theorem.

```
In[2]:= SubstTest[card, domain[funpart[t]], t → clock[x]]
```

```
Out[2]= card[clock[x]] == nat[x]
```

```
In[3]:= card[clock[x_]] := nat[x]
```

Corollary.

```
In[4]:= composite[CARD, CLOCK] // FastReifNormality
```

```
Out[4]= composite[CARD, CLOCK] == id[omega]
```

```
In[5]:= composite[CARD, CLOCK] := id[omega]
```

Corollary. The function **CLOCK** is one-to-one.

```
In[6]:= SubstTest[implies, and[FUNCTION[v], equal[composite[u, v], id[domain[v]]]],
  FUNCTION[inverse[v]], {u → CARD, v → CLOCK}] // Reverse
```

```
Out[6]= FUNCTION[inverse[CLOCK]] == True
```

```
In[7]:= FUNCTION[inverse[CLOCK]] := True
```