## "AMAZING GRACE" AND CANTOR

Dr. Stan Hartzler Archer City ISD

A definition of *infinite set* that is helpful in the study of Cantor's Theorem is this:

A set is infinite if it is equivalent to a proper subset of itself. (Berlinghoff & Grant, 1992.)

An example of such a set, and application of the definition, is suggested in the last verse of the hymn, "Amazing Grace":

When we've been there ten-thousand years Bright shining as the sun We've no less days to sing God's praise Than when we've first begun.

The verse suggests the following demonstration of equivalence:

Cantor's work began to interest other mathematicians in the late 1800's. "Amazing Grace" was written by John Newton in the late 1700's. The last verse written above is credited by *The Baptist Hymnal* (1991) to an anonymous writer around 1790; *Crusader Hymns and Hymn Stories* (1967) has this last verse ascribed to John P. Rees (1828-1900).

## REFERENCES

The Baptist Hymnal. Convention Press, 1991.

Berlinghoff, W. et al. A Mathematics Sampler, third edition. New York: Ardsley House Publishers, 1992.

Graham, Billy. Crusader Hymns and Hymn Stories. Minneapolis: The Billy Graham Evangelistic Association, 1967.

Newton, J. "Amazing Grace." 1779.