

Calculus, Volume 1, 2nd Edition - Tom M.
Apostal

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Chapter 1

Introduction

1.1 Some Basic Concepts of the Theory of Sets

1.1.1 Exercises

1. Use the roster notation to designate the following sets of real numbers.

Proposition 1. $A = \{x|x^2 - 1 = 0\}$ can be designated as $\{-1, 1\}$ in roster notation.

Proof.

$$\begin{aligned} A &= \{x|x^2 - 1 = 0\} \\ &= \{x|(x - 1)(x + 1) = 0\} \\ &\therefore \{-1, 1\} \end{aligned} \tag{1.1}$$

QED

Proposition 2. $B = \{x|(x - 1)^2 = 0\}$ can be designated as $\{1\}$ in roster notation.

Proof.

$$\begin{aligned} B &= \{x|(x - 1)^2 = 0\} \\ &= \{x|x - 1 = \sqrt{0}\} \\ &= \{x|x = 1\} \\ &\therefore \{1\} \end{aligned} \tag{1.2}$$

QED

Proposition 3. $C = \{x|x + 8 = 9\}$ can be designated as $\{TODO\}$ in roster notation.

Proof.

$$\begin{aligned} TODO &= TODO \\ \therefore \{TODO\} \end{aligned} \tag{1.3}$$

QED

Proposition 4. $D = \{x|x^3 - 2x^2 + x = 2\}$ can be designated as $\{TODO\}$ in roster notation.

Proof.

$$\begin{aligned} TODO &= TODO \\ \therefore \{TODO\} \end{aligned} \tag{1.4}$$

QED

Proposition 5. $E = \{x|(x + 8)^2 = 9^2\}$ can be designated as $\{TODO\}$ in roster notation.

Proof.

$$\begin{aligned} TODO &= TODO \\ \therefore \{TODO\} \end{aligned} \tag{1.5}$$

QED

Proposition 6. $F = \{x|(x^2 + 16x)^2 = 17^2\}$ can be designated as $\{TODO\}$ in roster notation.

Proof.

$$\begin{aligned} TODO &= TODO \\ \therefore \{TODO\} \end{aligned} \tag{1.6}$$

QED