Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 7th edition
Extra Examples
Section 1.7—Introduction to Proofs

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

---

p.81, icon below start of "Understanding How Theorems Are Stated" subsection
#1. Sometimes quantifiers in statements are understood, but do not actually appear in the words of the statement. Explain what quantifiers are understood in the statement "The product of two negative numbers is positive."

See Solution

---

p.81, icon below start of "Understanding How Theorems Are Stated" subsection
#2. Consider the theorem "If x ends in the digit 3, then x^3 ends in the digit 7." What quantifier is understood, but not written?

See Solution

---

p.81, icon below start of "Understanding How Theorems Are Stated" subsection
#3. Consider the theorem "No squares of integers end in the digit 8." What quantifier is understood, but not written?

See Solution

---

p.81, icon below start of "Understanding How Theorems Are Stated" subsection
#4. Consider the theorem "The average of two numbers can be 0." What quantifier is understood, but not written?

See Solution

---

p.83, icon at Example 1
#1. Using the definitions of even integer and odd integer, give a direct proof that this statement is true for all integers n:

If n is odd, then $5n + 3$ is even.

See Solution

---

p.84, icon at Example 3
#1. Using the definitions of even integer and odd integer, give a proof by contraposition that this statement is true for all integers n:

If $3n - 5$ is even, then n is odd.

See Solution

---

p.84, icon at Example 3
#2. Suppose we need to prove that this statement is true for all integers n, using the definitions of even integer and odd integer:

If $7n - 5$ is odd, then n is even.

See Solution

---

p.85, icon at Example 7
#1. Suppose a, b, and c are odd integers. Prove that the roots of $ax^2 + bx + c = 0$ are not rational.

See Solution

---

p.86, icon at Example 9
#1. Give a proof by contradiction of: "If n is an even integer, then $3n + 7$ is odd."

See Solution

---

p.87, icon at Example 12
#1. Prove that this statement is true for all integers n: n is odd if and only if $5n + 3$ is even.

See Solution

---

p.88, icon at Example 14
#1. Show that the statement "Every integer is less than its cube" is false by finding a counterexample.

See Solution
