

Show your work.

Section 1.7

6. Use a direct proof to show that the product of two odd numbers is odd.

12. Prove or disprove that the product of a nonzero rational number and an irrational number is irrational.

18. Prove that if n is an integer and $3n+2$ is even, then n is even using
 - a) a proof by contraposition.
 - b) a proof by contradiction.

24. Show that at least three of any 25 days chosen must fall in the same month of the year.

26. Prove that if n is a positive integer, then n is even if and only if $7n + 4$ is even.

Section 1.8

4. Use a proof by cases to show that $\min(a, \min(b, c)) = \min(\min(a, b), c)$ whenever a , b , and c are real numbers.

6. Prove using the notion of without loss of generality that $5x + 5y$ is an odd integer when x and y are integers of opposite parity.

8. Prove that there is a positive integer that equals the sum of the positive integers not exceeding it. Is your proof constructive or nonconstructive?

16. Show that if a , b , and c are real numbers and $a \neq 0$, then there is a unique solution of the equation $ax + b = c$.