

In your solutions you must explain what you are doing using complete sentences.

Section 3.3 - Greatest Common Divisors

Exercise 2: Find the GCD of the following pairs:

5, 15	-27, -45	100, 121
0, 100	-90, 100	1001, 289

Exercise 6: Let a be a positive integer. What is the GCD of a and $a + 2$?

Exercise 18: Find three mutually relatively prime integers from among the integers 66, 105, 42, 70, and 165.

Section 3.4 - The Euclidean Algorithm

Exercise 2: Use the Euclidean Algorithm to find the GCD of each of the following pairs:

51, 87	981, 1234
105, 300	34709, 100313

Exercise 4: For each of the pairs in Exercise 2 write the GCD as a linear combination of the two integers.

Section 3.5 - The Fundamental Theorem of Arithmetic

Exercise 30: Find the LCM of each of the following pairs:

8, 12	28, 35	256, 5040
14, 15	111, 303	343, 999

Exercise 35: One kind of cicada emerges every 17 years. Another kind emerges every 13 years. If they both emerge in the year 1900, what is the next year that they will both emerge in again?

Exercise 36: Which pairs of integers a and b have gcd 18 and lcm 540?

Exercise 40: Use Lemma 3.4 to show that if p is prime and $a \in \mathbb{Z}$ such that $p|a^2$, then $p|a$.

Exercise 50: Find the two positive integers with sum 798 and LCM 10,780.

Exercise 64: A company sells \$375,961 of a book. If the price of the book is an exact dollar amount greater than \$1, how many copies did they sell?

Exercise 68: Show that if a_1, a_2, \dots, a_n are pairwise relatively prime, then $\text{lcm}(a_1, a_2, \dots, a_n) = a_1 a_2 \dots a_n$

Questions Not in Book

Divisors of Products - Is it true that if $a|bc$ then $a|b$ or $a|c$?

1. Show that the answer to the above question is NO by finding three positive integers $a < b$ and $a < c$ with $a|bc$ but with $a \nmid b$ and $a \nmid c$.
2. Prove that if $a|bc$ and if $\text{gcd}(a, b) = 1$ then $a|c$.

Ten Divisors - Characterize the integers with exactly 10 divisors and give a few examples of each type.