Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 7th edition
Extra Examples
Section 4.1—Divisibility and Modular Arithmetic

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

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p.238, icon at Example 2
#1. Certain rules allow us to determine by inspection when a positive integer n is divisible by a positive integer k. For example, $5 \mid n$ if and only if n ends in the digit 5 or 0. Similarly, $2 \mid n$ if and only if n ends in one of the digits $0, 2, 4, 6, 8$.
There is also a rule to determine divisibility by 3:

$$3 \mid n \text{ if and only if the sum of the digits in } n \text{ is divisible by 3.}$$

For example $3 \mid 478{,}125$ because the sum of the six digits in 478,125 is 27, which is divisible by 3. Why does the rule work?

See Solution

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p.238, icon at Example 2
#2.
(a) Find the number of positive integer divisors of $648 = 2^3 3^4$.
(b) Find the sum of all positive integer divisors of 648.

See Solution

p.240, icon at Example 4

#1. For each pair of numbers, when the division algorithm is used to divide a by d, what are the quotient q and remainder r?

(a) $a = 88$, $d = 11$.

(b) $a = -29$, $d = 9$

(c) $a = 58^{237}$, $d = 58^{168}$

See Solution