

الجامعة المصرية
للتعلم الإلكتروني الأهلية



THE EGYPTIAN E-LEARNING UNIVERSITY

EELU

GEN206

Discrete Mathematics

Section 7

Faculty of Information Technology
Egyptian E-Learning University

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13. What are the quotient and remainder when

a) 19 is divided by 7?

(a) Quotient 2 and Remainder 5

g) -1 is divided by 3?

(g) Quotient -1 and Remainder 2

b) -111 is divided by 11?

(b) Quotient -11 and Remainder 10

h) 4 is divided by 1?

(h) Quotient 4 and Remainder 0

32. List five integers that are congruent to 4 modulo 12.

4, 16, 28, 40, 52, ...

33. List all integers between -100 and 100 that are congruent to -1 modulo 25 .

$$\{-76, -51, -26, -1, 24, 49, 74, 99\}$$

34. Decide whether each of these integers is congruent to 3 modulo 7.

a) 37

b) 66

c) -17

d) -67

(a) Not congruent to 3 mod 7

(b) Congruent to 3 mod 7

(c) Not congruent to 3 mod 7

(d) Congruent to 3 mod 7

1. Determine whether each of these integers is prime.

a) 21

b) 29

c) 71

d) 97

e) 111

f) 143

- (a) Not prime
- (b) Prime
- (c) Prime
- (d) Prime
- (e) Not prime
- (f) Not prime

4. Find the prime factorization of each of these integers.

a) 39

b) 81

c) 101

d) 143

e) 289

f) 899

a. $39 = 3 * 13$

b. $81 = 3^4$

c. $101 = 101$

d. $143 = 11 * 13$

e. $289 = 17^2$

f. $899 = 29 * 31$

24. What are the greatest common divisors of these pairs of integers?

a) $2^2 \cdot 3^3 \cdot 5^5, 2^5 \cdot 3^3 \cdot 5^2$

b) $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13, 2^{11} \cdot 3^9 \cdot 11 \cdot 17^{14}$

c) $17, 17^{17}$

d) $2^2 \cdot 7, 5^3 \cdot 13$

e) $0, 5$

f) $2 \cdot 3 \cdot 5 \cdot 7, 2 \cdot 3 \cdot 5 \cdot 7$

(a) $2^2 \cdot 3^3 \cdot 5^2$ or 2700

(b) $2 \cdot 3 \cdot 11$ or 66

(c) 17

(d) 1

(e) 5

(f) $2 \cdot 3 \cdot 5 \cdot 7$ or 210

25. What are the greatest common divisors of these pairs of integers?

a) $3^7 \cdot 5^3 \cdot 7^3, 2^{11} \cdot 3^5 \cdot 5^9$

b) $11 \cdot 13 \cdot 17, 2^9 \cdot 3^7 \cdot 5^5 \cdot 7^3$

c) $23^{31}, 23^{17}$

d) $41 \cdot 43 \cdot 53, 41 \cdot 43 \cdot 53$

e) $3^{13} \cdot 5^{17}, 2^{12} \cdot 7^{21}$

f) $1111, 0$

(a) $3^5 \cdot 5^3$ or 30375

(b) 1

(c) 23^{17}

(d) $41 \cdot 43 \cdot 53$ or 93439

(e) 1

(f) 1111

26. What is the least common multiple of each pair in Exercise 24?

- a) $2^2 \cdot 3^3 \cdot 5^5, 2^5 \cdot 3^3 \cdot 5^2$
- b) $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13, 2^{11} \cdot 3^9 \cdot 11 \cdot 17^{14}$
- c) $17, 17^{17}$
- d) $2^2 \cdot 7, 5^3 \cdot 13$
- e) $0, 5$
- f) $2 \cdot 3 \cdot 5 \cdot 7, 2 \cdot 3 \cdot 5 \cdot 7$

- (a) $2^5 \cdot 3^3 \cdot 5^5$
- (b) $2^{11} \cdot 3^9 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17^{14}$
- (c) 17^{17}
- (d) $2^2 \cdot 5^3 \cdot 7 \cdot 13$
- (e) Undefined
- (f) $2 \cdot 3 \cdot 5 \cdot 7$

27. What is the least common multiple of each pair in Exercise 25?

- a) $3^7 \cdot 5^3 \cdot 7^3, 2^{11} \cdot 3^5 \cdot 5^9$
- b) $11 \cdot 13 \cdot 17, 2^9 \cdot 3^7 \cdot 5^5 \cdot 7^3$
- c) $23^{31}, 23^{17}$
- d) $41 \cdot 43 \cdot 53, 41 \cdot 43 \cdot 53$
- e) $3^{13} \cdot 5^{17}, 2^{12} \cdot 7^{21}$
- f) $1111, 0$

- (a) $2^{11} \cdot 3^7 \cdot 5^9 \cdot 7^3$
- (b) $2^9 \cdot 3^7 \cdot 5^5 \cdot 7^3 \cdot 11 \cdot 13 \cdot 17$
- (c) 23^{31}
- (d) $41 \cdot 43 \cdot 53$
- (e) $2^{12} \cdot 3^{13} \cdot 5^{17} \cdot 7^{21}$
- (f) Undefined

28. Find $\gcd(1000, 625)$ and $\text{lcm}(1000, 625)$ and verify that $\gcd(1000, 625) \cdot \text{lcm}(1000, 625) = 1000 \cdot 625$.

$$\gcd(1000, 625) = 125$$

$$\text{lcm}(1000, 625) = 5000$$

$$\gcd(1000, 625) \cdot \text{lcm}(1000, 625) = 625 \cdot 1000$$



Thank You

