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Online Homework

Focused Exercises for Math SAT

Skill Set 25: Divisibility/ Remainder Problems

Many of the problems in this exercise set came from The College Board, writers of the SAT exam.

1. If k is a positive integer divisible by 3, and if $k < 60$, what is the greatest possible value of k ?
- (A) 55
 - (B) 56
 - (C) 57
 - (D) 58
 - (E) 59

2. If x is divisible by 3 and y is divisible by 5, which of the following must be divisible by 15?

- I. xy
- II. $3x + 5y$
- III. $5x + 3y$

- (A) I only
- (B) III only
- (C) I and II only
- (D) I and III only
- (E) I, II, and III

3.

All numbers that are divisible by both 2 and 6 are also divisible by 4.

Which of the following numbers can be used to show that the statement above is FALSE?

- (A) 4
- (B) 8
- (C) 12
- (D) 18
- (E) 24

4. If p is an integer and 3 is the remainder when $2p + 7$ is divided by 5, then p could be

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

5. When 15 is divided by the positive integer k , the remainder is 3. For how many different values of k is this true?
- (A) One
 - (B) Two
 - (C) Three
 - (D) Four
 - (E) Five
6. Which of the following could be the remainders when 4 consecutive positive integers are each divided by 3 ?
- (A) 1, 2, 3, 1
 - (B) 1, 2, 3, 4
 - (C) 0, 1, 2, 3
 - (D) 0, 1, 2, 0
 - (E) 0, 2, 3, 0
7. The sum of the integers t and w is 495. The units digit of t is 0. If t is divided by 10, the result is equal to w . What is the value of t ?
- (A) 40
 - (B) 45
 - (C) 245
 - (D) 250
 - (E) 450
8. The integer m is between 40 and 100. When m is divided by 3, the remainder is 2. When m is divided by 7, the remainder is 1. What is one possible value of m ?
9. When a positive integer n is divided by 5, the remainder is 4. Which of the following expressions will yield a remainder of 2 when it is divided by 5 ?
- (A) $n + 1$
 - (B) $n + 2$
 - (C) $n + 3$
 - (D) $n + 4$
 - (E) $n + 5$

10. The tens digit of a two-digit number is 3 and the units digit is H . If the two-digit number is divisible by H , which of the following CANNOT be the value of H ?
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5
 - (E) 6
11. Which of the following numbers disproves the statement "A number that is divisible by 3 and by 6 is also divisible by 9" ?
- (A) 18
 - (B) 30
 - (C) 36
 - (D) 54
 - (E) 90
12. If an integer k is divisible by 2, 3, 6, and 9, what is the next larger integer divisible by these numbers?
- (A) $k + 6$
 - (B) $k + 12$
 - (C) $k + 18$
 - (D) $k + 30$
 - (E) $k + 36$
13. When 247 is divided by 6, the remainder is r , and when 247 is divided by 12, the remainder is s . What is the value of $r - s$?
- (A) -6
 - (B) -1
 - (C) 0
 - (D) 1
 - (E) 6
14. If the integer n is divided by 7, the remainder is 2. What is the remainder if $5n$ is divided by 7 ?
- (A) 0
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) 5

15. Which of the following numbers is divisible by 3 and 5, but not by 2 ?

- (A) 955
- (B) 975
- (C) 990
- (D) 995
- (E) 999

16. All numbers divisible by both 4 and 15 are also divisible by which of the following?

- (A) 6
- (B) 8
- (C) 18
- (D) 24
- (E) 45