Number Theory 5B3

(1) _____ What percent of all three digit numbers contain the digit 5 at least once?

(2) _____ Express the ratio of $\frac{2}{7}$ to $1.\overline{09}$ as a common fraction.

(3) _____ The sum of the proper divisors of 18 is 21. What is the sum of the proper divisors of 198?

(4) _____ What is the 43rd digit after the decimal point in the decimal representation of $\frac{1}{13}$?

(5) _____ A bag of candy can be divided in equal shares among 2, 3, 4, 5, or 6 friends. What is the least number of pieces of candy that the bag could contain?

(6) _____ The arithmetic mean of an odd number of consecutive odd integers is y. Find the sum of the smallest and the largest of the integers.

(7) _____ Find the product of the square root of 1764 and the largest prime factor of 1764.

(8) _____ Two different prime numbers are selected at random from among the first ten prime numbers. What is the probability that the sum of the two primes is 24? Express your answer as a common fraction.

(9) _____ What two whole numbers, neither of which contains zeros, when multiplied together equal exactly 1,000,000,000?

(10) _____ Given that the repetend in the decimal representation of $\frac{1}{19}$ contains 18 digits, find the 39th digit in the decimal representation.

(11) _____ Any even whole number greater than 7 can be written as the sum of two distinct primes. What is the largest product for two such primes whose sum is 150?

(12) _____ What is the greatest three-digit number divisible by both 7 and 8?

(13) _____ What number is less than 35^2, greater than 34^2, divisible by 19, and a multiple of 9?

(14) _____ Find a positive integer that is divisible by 18 and whose cube root is a number between 8 and 8.1.