WARMUP PROBLEMS

CROSSROADS ACADEMY
MATHCOUNTS PREPARATION

1. Perfect Numbers

(1) What is the sum of the factors of 30?

(2) What is the product of the factors of 27?

(3) What is the average of the factors of 12?

(4) What is the sum of the factors of 2^n for any n?

(5) How many 3 digit integers have exactly 3 factors?

(6) How many factors does 70 have?

(7) How many odd numbers are factors of 240?

(8) Is the number 181 prime?

(9) A perfect number is one whose sum of divisors is equal to twice the number. An example is 6 since $1 + 2 + 3 + 6 = 12 = 2 \cdot 6$ while 8 is not an example since $1 + 2 + 4 + 8 = 15 \neq 16 = 2 \cdot 8$. What is the next perfect number after 6?

(10) A number is called deficient if the sum of its factors is smaller than twice the number and abundant if the sum of its factors is more than twice the number of factors. Of all the integers from 2 to 30, how many are deficient and abundant?

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