

## Quiz # 8 for Dr. Z.'s Number Theory

NAME: (print!) \_\_\_\_\_

E-MAIL ADDRESS: (print!) \_\_\_\_\_

1. (i) (2 pts.) Define  $\sigma_2(n)$  (ii) (2 pts.) State the formula for  $\sigma_2(n)$  in terms of the expression of  $n$  as a product of prime powers (iii) (2 pts.) Verify it for  $n = 15$  by using the definition and the formula

2. (4 pts.) Prove that if  $p$  is a prime, and  $2^p - 1$  is also a prime, then

$$2^{p-1} \cdot (2^p - 1)$$

is a perfect number.