

Dr. Z.'s Number Theory Homework assignment 6

1.: Using the recursive algorithm **directly**, find the proudct-of-prime-powers representation of

a. 1000 **b.** 7007 **c.** 2700 **d.** 1024

2. Use any method to find the proudct-of-prime-powers representation of

a. a googol : 10^{100} **b.:** a googolplex $10^{10^{100}}$

c.

$$(3^3 \cdot 5^{101} \cdot 11^{11}) \cdot (3 \cdot 5^3 \cdot 11^{12} \cdot 13^2 \cdot 41^2) \quad .$$

3. (challenge) Yesterday I went to a bookstore and I overheard a conversation between two people

A. This is a nice book, are you going to buy it?

B. I like it, since the number in the title is the product of the ages of my three children, can you figure their ages?

A. Of course not, there are several possibilities.

B. But let me add that all the ages are distinct (i.e. I have neither twins nor a triplet), and their ages is at least 2.

A. Yes, now I know the ages of your children.

Can **YOU** figure out their ages?