Mathematical Circles

Chap 0, Prob 1) A number of bacteria are placed in a glass. One second later each bacterium divides in two, the next second each of the resulting bacteria divides in two again, etc. After one minute the glass is full. When was the glass half-full?

Ans: Since the bacterias divides into two after 1sec, the total no. of bacteria double after 1 sec. The glass gets full after 60secs.

∴ Its logical to conclude that the glass must be half-full after 59 sec.

Chap 0, Prob 2) Ann, John and Alex took a bus tour of Disneyland. Each of them must pay 5 plastic chips for the ride, but they have only plastic coins of values 10, 15 and 20 chips (each has an unlimited number of each type of coin). How can they pay for the ride?

Ans: John pays 15 chips. Alex gives John 20 chips, gets 15 chips in return.

John gives Ann 15 chips, gets 2 10 chips in return.