Solution to the Perfectly Logical Pirates Problem
By Philip Thomas, January 2011

First, consider the problem with only two pirates. We number them 1 and 2, where the higher the number, the more fierce the pirate. Pirate 2 would give himself all of the gold, because in the case of a tie he wins, so no matter what pirate 1 votes, pirate 2 wins.

With three pirates (1,2,3), pirate three knows that pirate 2 will vote against him, because if pirate 3 dies, pirate two will get all the gold (see previous paragraph). Pirate 1 knows that if pirate 3 dies he will get no gold (see previous paragraph), so he would vote for pirate 3's plan even if given only one piece of gold. Thus, pirate 3 proposes that pirate 1 gets 1 gold, pirate 2 none, while he keeps the rest.

We repeat this process. With four pirates, pirate 4 gives one piece to pirate 2 and keeps the rest. With five pirates, pirate 5 gives one piece to pirates 1 and 3, and keeps the rest. See the pattern? With 100 pirates, pirate 100 gives one piece to all even numbered pirates, and keeps the rest.