



## Problem of the Week

### Grade 7 and 8

### What is the Deal Anyway?

#### Solution

#### Problem

Three playing cards are placed in a row, from left to right. One card is a club ( $\clubsuit$ ), one card is a diamond ( $\diamondsuit$ ), and one card is a heart ( $\heartsuit$ ). The number on each card is different. One card is a four, one card is a five and one card is an eight. Using the following clues, determine the exact order of the cards, from left to right, including the suit and number.

1. The club is somewhere to the right of the heart.
2. The 5 is somewhere to the left of the heart.
3. The 8 is somewhere to the right of the 4.

#### Solution

There are six ways to order the suits:

$(\clubsuit, \diamondsuit, \heartsuit)$ ,  $(\clubsuit, \heartsuit, \diamondsuit)$ ,  $(\diamondsuit, \clubsuit, \heartsuit)$ ,  $(\diamondsuit, \heartsuit, \clubsuit)$ ,  $(\heartsuit, \clubsuit, \diamondsuit)$ , and  $(\heartsuit, \diamondsuit, \clubsuit)$ .

The first clue tells us that the club is somewhere to the right of the heart. We can eliminate the first three from the above list since the club is to the left of the heart in each case. There are now only three ways to order the suits:

$(\diamondsuit, \heartsuit, \clubsuit)$ ,  $(\heartsuit, \clubsuit, \diamondsuit)$ , and  $(\heartsuit, \diamondsuit, \clubsuit)$ .

The second clue says that the 5 is somewhere to the left of the heart. This means that the heart cannot be the leftmost card. This eliminates the last two possibilities from the above list. The only possibility is  $(\diamondsuit, \heartsuit, \clubsuit)$  and the 5 must be the five of diamonds giving us  $(5\diamondsuit, 4\heartsuit, 8\clubsuit)$ .

The third clue tells us that the 8 is somewhere to the right of the 4. With only two spots to decide, we can conclude that the 8 must be in the rightmost (third) spot and the last two cards are the 4 of hearts and the 8 of clubs. This gives us  $(5\diamondsuit, 4\heartsuit, 8\clubsuit)$ .

$\therefore$  the cards are dealt in the following order: 5 of diamonds, 4 of hearts, and 8 of clubs.

