



Problem of the Week

Problem A

Cribbage Scoring

Cribbage is a card game that is played with a standard deck of 52 cards. There are four suits: clubs ♣, diamonds ♦, hearts ♥, and spades ♠. Each suit has 13 cards identified with either a letter or number as follows: A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K. These letters and numbers are called the card's *rank*. Since there are four suits, there are four cards with the same rank in every deck. *Note: In this activity we will ignore the suits and just focus on the ranks.*

To determine the number of points a hand is worth, each player makes combinations using 2, 3, 4, or 5 of their cards. Cards can be used more than once in different combinations. These are the combinations that count for points:

- Each combination that totals 15 is worth 2 points. When making these combinations, an A is worth 1, a J, Q, or K is worth 10, and all number cards are worth their rank. For example:

$$6 + 9 = 15 \text{ is worth 2 points}$$

$$5 + Q = 15 \text{ is worth 2 points}$$

$$2 + 4 + 9 = 15 \text{ is worth 2 points}$$

- Each pair of cards that have the same rank is worth 2 points.
- Each combination of three or more cards that form a sequence of consecutive ranked cards is worth the number of cards in the sequence. For example:

$$3, 4, 5 \text{ is worth 3 points}$$

$$8, 9, 10, J \text{ is worth 4 points}$$

Which of the following hands is worth the most points?

Hand A: 5♥, 10♦, J♠, Q♣, and K♠

Hand B: A♠, 6♣, 7♦, 7♥, and 8♣

Hand C: 5♣, 5♥, 5♠, 8♠, and Q♦

Justify your answer.

