

## Answer on Question #81463 – Math – Statistics and Probability

### Question

Consider the game of value three points; shuffle a deck of three cards: ace of diamond, queen of diamond, king of diamond. with the ace worth 1 point, queen 2 points and king 3 points. draw cards until total points are 3 or more, you win if your total is exactly 3 points, what is the probability that you win

### Solution

Possible outcomes: {K, QA, QQ, QK, AQ, AK, AAA, AAQ, AAK}

Possible winning combinations: {K, QA, AQ, AAA}.

Probabilities:  $P(K) = P(A) = P(Q) = \frac{1}{3}$ ,

$$P(QA) = P(AQ) = P(A) \cdot P(Q) = \frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9},$$

$$P(AAA) = P(A) \cdot P(A) \cdot P(A) = \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} = \frac{1}{27}.$$

Probability of winning:

$$P = P(K) + P(QA) + P(AQ) + P(AAA) = \frac{1}{3} + \frac{1}{9} + \frac{1}{9} + \frac{1}{27} = \frac{16}{27} \approx 0.5926.$$