E:

The probability that the American League team win 2 of the first five games:

$P(\overline{A_1} \cap \overline{A_2} \cap A_3 \cap A_4 \cap A_5) + P(\overline{A_1} \cap A_2 \cap \overline{A_3} \cap A_4 \cap A_5) + P(\overline{A_1} \cap A_2 \cap A_3 \cap \overline{A_4} \cap A_5) + P(\overline{A_1} \cap A_2 \cap A_3 \cap A_4 \cap \overline{A_5}) + P(A_1 \cap \overline{A_2} \cap \overline{A_3} \cap A_4 \cap A_5) + P(A_1 \cap \overline{A_2} \cap A_3 \cap \overline{A_4} \cap A_5) + P(A_1 \cap \overline{A_2} \cap A_3 \cap A_4 \cap \overline{A_5}) + P(A_1 \cap A_2 \cap \overline{A_3} \cap \overline{A_4} \cap A_5) + P(A_1 \cap A_2 \cap \overline{A_3} \cap A_4 \cap \overline{A_5}) + P(A_1 \cap A_2 \cap A_3 \cap \overline{A_4} \cap \overline{A_5}) = 0.2306875$

The probability that the American League team win 2 of the first five games and win the World Series:

$P(\overline{A_1} \cap \overline{A_2} \cap A_3 \cap A_4 \cap A_5 \cap \overline{A_6} \cap \overline{A_7}) + P(\overline{A_1} \cap A_2 \cap \overline{A_3} \cap A_4 \cap A_5 \cap \overline{A_6} \cap \overline{A_7}) + P(\overline{A_1} \cap A_2 \cap A_3 \cap \overline{A_4} \cap A_5 \cap \overline{A_6} \cap \overline{A_7}) + P(\overline{A_1} \cap A_2 \cap A_3 \cap A_4 \cap \overline{A_5} \cap \overline{A_6} \cap \overline{A_7}) + P(A_1 \cap \overline{A_2} \cap \overline{A_3} \cap A_4 \cap A_5 \cap \overline{A_6} \cap \overline{A_7}) + P(A_1 \cap \overline{A_2} \cap A_3 \cap \overline{A_4} \cap A_5 \cap \overline{A_6} \cap \overline{A_7}) + P(A_1 \cap \overline{A_2} \cap A_3 \cap A_4 \cap \overline{A_5} \cap \overline{A_6} \cap \overline{A_7}) + P(A_1 \cap A_2 \cap \overline{A_3} \cap \overline{A_4} \cap A_5 \cap \overline{A_6} \cap \overline{A_7}) + P(A_1 \cap A_2 \cap \overline{A_3} \cap A_4 \cap \overline{A_5} \cap \overline{A_6} \cap \overline{A_7}) + P(A_1 \cap A_2 \cap A_3 \cap \overline{A_4} \cap \overline{A_5} \cap \overline{A_6} \cap \overline{A_7}) = 0.0560625$

The probability that the American League team will win the World Series if they have won 2 of the first five games:

$\frac{0.0560625}{0.2306875} = 0.24302357084800869$

F: From answer B, C and E we know that the probability that the National League team wins the World Series:

P(4 games and National League team wins)=0.2953125

P(5 games and National League team wins)=0.16875

P(6 games and National League team wins)=0.13725

P(7 games and National League team wins)=0.0560625

Given that the National League team wins the World Series the probability that the series lasted seven games:

$\frac{0.0560625}{0.0560625+0.13725+0.16875+0.2953125} = 0.08528237307472904$