16.3. Teams A and B play in a basketball tournament. The team that first wins 3 games wins the tournament. Find the number of possible ways in which the tournament can occur.

Construct the appropriate tree diagram:

The tournament can occur in twenty ways:
AAA, AABA, AABBA, AABBE, ABAA, ABABA, ABABB, ABBA, ABBA, ABBB, BABAA, BABBB, BABA, BAAAB, BABAB, BABB, BAAA, BBAAA, BBAB, BBB

16.4. A man is at the origin on the x-axis and takes a one unit step either to the left or to the right. He stops if he reaches 3 or −3, or if he occupies any position, other than the origin, more than once. Find the number of different paths the man can travel.

Construct the appropriate tree diagram.

There are 14 different paths, each path corresponding to an end point of the tree diagram.