26. 

a) Since order/position doesn't matter: 
\[ C(13, 10) = \frac{13!}{10!3!} = \frac{13 \cdot 12 \cdot 11}{3 \cdot 2 \cdot 1} = 286 \]

b) Since order/position matters: 
\[ P(13, 10) = 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 = 1,087,836,800 \]

c) There are 286 possible combinations for the team when sex is not a factor. Since there is only one way to set up the team that excludes all three women, there are 
\[ 286 - 1 = 285 \] combinations that include at least one woman.

4. From the binomial theorem, it follows that 
\[ \binom{13}{5} = \frac{13!}{5!8!} = \frac{13 \cdot 12 \cdot 11 \cdot 10 \cdot 9}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = 1,287 \]
20. By definition of combinations:

\[
\binom{n-1}{k-1} \cdot \binom{n}{k} = \frac{(n-1)!}{(k-1)!(n-1-(k-1))!} \cdot \frac{n!}{(k+1)!(n-(k+1))!} = \frac{(n+1)!}{k!(n+1-k)!}
\]

by multiplying out = \[
\frac{(n-1)! \cdot n! \cdot (n+1)!}{(k-1)!(n-k)!(k+1)!(n-k-1)! \cdot k!(n+1-k)!}
\]

by factoring = \[
\frac{(n-1)!}{k!(n-k-1)!} \cdot \frac{n!}{(k-1)!(n-k+1)!} \cdot \frac{(n+1)!}{(k+1)!(n-k)!}
\]

again, by combinatorial definition = \[
\binom{n-1}{k-1} \cdot \binom{n}{k} = \binom{n-1}{k-1} \cdot \binom{n}{k-1} \cdot \binom{n}{k+1}
\]

8. The number of 12 combinations from a set with 21 elements is 

\[
\binom{12+21-1}{21} = \binom{32}{21} = \frac{32!}{21! \cdot 11!} = \frac{32 \cdot 31 \cdot 29 \cdot 28 \cdot 27 \cdot 26 \cdot 25 \cdot 24 \cdot 23 \cdot 22}{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6}
\]

= 1,024,480

40. There are a total of 4 + 3 + 5 + 4 = 16 total moves needed, 4 indistinguishable moves in the x direction, 3 in the y direction, 5 in the z direction, and 4 in the w direction.

Thus we compute

\[
\frac{16!}{4! \cdot 3! \cdot 5! \cdot 4!} = \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6}{24 \cdot 24 \cdot 5 \cdot 5 \cdot 5 \cdot 24 \cdot 6} = 50,450,400
\]