30

6 universities, 2 years.
A - # of ways to select hosts if they can not both be held at the same university.

6 choices in year 1, 5 in year 2. $6 * 5 = 30$

B - # of ways to select hosts if they *may* both be at the same university.

6 choices year 1, 6 year 2. $6 * 6 = 36$

34

15 multiple choice questions, 3 choices each. Num of unique answers.
3 choices each, 15 times. $3^{15} = 14348907$

36

4 stops from 10 cities Number of different trips.

A - order matters $10 * 9 * 8 * 7$ since the choices decrease each time.

B - order does not matter That's just a combination - $\binom{10}{4} = \frac{10!}{(10-4)!4!}$

40

A - # of ways for 5 people to get on a bus
5!

B - if two people refuse to follow each other

Should be num of ways the total can line up, less the number of combinations that include the 2 people next toe each other.
$(5! - \text{something})$
If theyre together they move as a unit, so can be treated as one.
$5! - 4!$

42

A - Permutations of the word "great"
5 unique letter - 5!

B - the word "greet"

5 letters, 2 are duplicates of each other. $\frac{5!}{2!}$

43

A - permutations of "statistics" 10 letters, 3 "s" 3 "t" 2 "i" $\frac{10!}{3!3!2!}$

B - How many begin and end with "s"

We can treat this as the word "tatistic" and place the extra s's at the beginning and end.

8 letters, 3 "t", 2"i" - $\frac{8!}{3!2!}$

46

20 question true false

A - 7 right, 13 wrong

This is like the theorem we discussed in class, where when you pick one number, the opposite case is the same. \$$\therefore\ 20\binom{}{7\$\$\$B-\binom{20}{10}}$ C - At least 17 are right - this would be 17, or 18, or 19... $\therefore \binom{20}{17}+\binom{20}{18}+\binom{20}{19}+\binom{20}{20}$

51

Num of ways 1 "a", 3 "b", 2 "c", 1"f" can be distributed among 7 students. Its just 7 choose 1 and 7-1 choose 3 and... $\binom{7}{1}\binom{6}{3}\binom{3}{2}\binom{1}{1}$