

3. (13 points) A True - False test consists of ten questions. If a student selects answers at random, then what is the probability that the student will guess at least 7 correct answers?

There are 2^{10} ways to fill out the exam.

1 way is perfect

10 ways have 9 correct answers

$\binom{10}{2}$ ways have 8 correct answers

$\binom{10}{3}$ ways have 7 correct answers

$$\frac{1 + 10 + \binom{10}{2} + \binom{10}{3}}{2^{10}}$$

$$7 \text{ or } \frac{\binom{10}{7}}{2^{10}}$$

4. (13 points) Eight friends decide to have their picture taken. How many ways are there to arrange all eight people in a straight line, if John refuses to stand next to Mary?

There are $8!$ ways to arrange the people.

$7!$ of these ways have J-M

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$$\text{Answer } 8! - 2(7!) = \boxed{7!(6)} = 42 \cdot 6!$$

30240

$$8 \text{ or } \binom{7}{2} 6!$$

4075 is plausible but wrong.