

# Answer Key

Name \_\_\_\_\_

Section \_\_\_\_\_

MA 162 Quiz 9 November 13, 2014

An exam consists of ten true-or-false questions. If a student guesses at every answer what is the probability that he or she will

a) answer exactly six questions correctly?

b) answer at least eight correctly?

\*\*Terms such as  $C(n, r)$  or  $P(n, r)$  don't need to be explicitly computed \*\*

The sample space  $S$  consists of  $2^{10}$  elements by the generalized multiplication principle, i.e.  $n(S) = 2^{10}$ . Let  $E$  denote all exams with exactly six correct answers and  $F$  denote all exams where 8, 9, or 10 questions are answered correctly.

a)

so  $n(E) = C(10, 6)$  which implies  $P(E) = \frac{n(E)}{n(S)} = \frac{C(10, 6)}{2^{10}} = \frac{210}{2^{10}} \approx .205$

b)

and  $n(F) = C(10, 8) + C(10, 9) + C(10, 10) = \frac{10!}{8!2!} + \frac{10!}{9!1!} + \frac{10!}{10!0!} = 56$

which implies  $P(F) = \frac{n(F)}{n(S)} = \frac{C(10, 8) + C(10, 9) + C(10, 10)}{2^{10}} = \frac{56}{2^{10}} \approx .0547$