PROBABILITY RULES

Complement (p. 190) $P(\bar{E}) = 1 - P(E)$

Addition Rule (p. 200 - **mutually exclusive**): P(A or B) = P(A) + P(B)

Addition Rule (p. 201 - **not mut. excl**):   P(A or B) = P(A) + P(B) - P(A and B)

Multiplication Rule (p. 211 - **independent**)   P(A and B) = P(A) * P(B)

Multiplication Rule (p. 214 - **dependent**) $P(A \text{ and } B) = P(A) * P(B \mid A)$

Independence Tests (p.211)   Use either one, you don't need to do both
     If P(A and B) = P(A) * P(B), then A and B are <u>independent.</u>
     If $P(A \text{ and } B) = P(A) * P(B \mid A)$, then A and B are <u>dependent.</u>

Conditional (p. 216) $P(B \mid A) = \dfrac{P(A \text{ and } B)}{P(A)}$

P(at least one of a group has A) = 1 – P(none of the group has A)   (p. 218)

COUNTING RULES

Counting Rule (p. 224) total possibilities when 1st event has k_1 possibilities, 2nd event has k_2 possibilities, etc. (may be a factorial)
$$k_1 \cdot k_2 \cdot k_3 \cdots k_n$$

Factorial (p. 227)   n! = n(n-1)(n-2) … 1   but 0! = 1

Permutations (p. 228-9)   on calculator or as formula $_nP_r = \dfrac{n!}{(n-r)!}$

Combinations (p. 230)   on calculator or as formula $_nC_r = \binom{n}{r} = \dfrac{n!}{(n-r)!\,r!}$