

HOMEWORK 2
PROB. AND STAT. FOR ENG. (STAT:2020; BOGNAR)

Do your homework on notebook paper. You will submit using Gradescope.

1. Textbook 2.56 (a), (b)
2. Textbook 2.69 (a), (b), (c)
3. Textbook 2.89 (a), (b)
4. Textbook 2.92
5. Textbook 2.93 (a)
6. Suppose A and B are independent events where $P(A) = 0.3$ and $P(B) = 0.4$.
 - (a) Find $P(B^c)$. *Show your work using clear notation.*
 - (b) Find $P(A \cup B)$. *Show your work using clear notation.*
 - (c) Find $P(A^c \cap B)$. *Show your work using clear notation.*
 - (d) Find $P(A^c \cup B)$. *Show your work using clear notation.*
7. *Potamopyrgus antipodarum* are a species of freshwater snails native to New Zealand. The probability a randomly selected young snail lives to adulthood is 70%, i.e. $P(A) = 0.70$.
 - (a) Suppose a researcher randomly selects 3 young snails (assume independence). Determine the probability that all live to adulthood. *Use notation such as A_1, A_2 , etc. Show your work using clear notation.*
 - (b) Suppose a researcher randomly selects 2 young snails (assume independence). Determine the probability that the first, second, or both snails live to adulthood. *Show your work using clear notation.*
 - (c) Suppose a researcher randomly selects 2 young snails (assume independence). Determine the probability that exactly 1 lives to adulthood. *Use notation such as A_1, A_1^c , etc. Show your work using clear notation.*
 - (d) Suppose a researcher randomly selects 5 young snails (assume independence). Determine the probability that 4 or fewer live to adulthood. *Hint: Use the complement rule. Show your work using clear notation.*
 - (e) Suppose a researcher randomly selects 3 young snails (assume independence). Determine the probability that exactly 2 live to adulthood. *Show your work using clear notation.*
 - (f) Suppose snails are repeatedly selected at random (assume independence). Determine the probability that the 4th selected snail is the 1st to live to adulthood. *Show your work using clear notation.*
 - (g) Suppose snails are repeatedly selected at random (assume independence). Determine the probability that the 4th selected snail is the 2nd to live to adulthood. *Show your work using clear notation.*