

# Section 3

## Assessment Questions

1. If there is 10% probability of rain and 20% probability of a thunderstorm, what is the probability of rain AND a thunderstorm?

- a. 0.02 (correct answer)
- b. 0.30
- c. 0.28
- d. 0.60

FEEDBACK: This is a joint probability problem, so we multiply the probability of both events *rain* and *thunderstorm* to calculate the probability both occur:  $0.1 \times 0.2 = 0.02$ .

2. If there is 10% probability of rain and 20% probability of a thunderstorm, what is the probability of rain or a thunderstorm?

- a. 0.20
- b. 0.30
- c. 0.28 (correct answer)
- d. 0.60

FEEDBACK: This is a union probability problem, so we add the probability of both events *rain* and *thunderstorm* to calculate the probability either occur. However, to prevent overlap in double counting we also subtract the joint probability:  $0.1 + 0.2 - 0.1 \times 0.2 = 0.28$ .

3. There is a 10% probability of rain and 20% probability of a thunderstorm. However, your meteorologist friend says that the probability of rain increases to 60% in the event of a thunderstorm. Assuming he is right, what is the probability of rain and a thunderstorm?

- a. 0.02
- b. 0.12 (correct answer)
- c. 0.28
- d. 0.60

FEEDBACK: This is a joint probability problem but with a conditional probability. Since the conditional probability is available and applicable, we multiply the probability of *thunderstorm* with *rain given thunderstrom* to calculate the probability both occur:  $0.2 \times 0.6 = 0.12$ .