DPH101/ENV203 Assignment Basic Probability ANSWERS

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Question 1

Given

Table 1. Skill retention by intervention group.

Competence	CPR	CC-CPR	Total
Yes	12	15	27
No	15	14	29
Total	27	29	56

Find the following probabilities:

1. $P(CC-CPR) = 29/56 = 0.5178$

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29/56
```

```
## [1] 0.5178571
```

2. $P(Competent) = 27/56 = 0.4821$

```
27/56
```

```
## [1] 0.4821429
```

3. $P(Competent \cap CPR) = P(Competent|CPR) \cdot P(CPR) = (12/27) \cdot (27/56) = 12/56 = 0.2143$

```
12/56
```

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## [1] 0.2142857
```

4. $P(Competent \cup CC-CPR) = P(Competent) + P(CC-CPR) - P(Competent \cap CC-CPR) = 27/56 + 29/56 - 15/56 = 41/56 = 0.7321$

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41/56
```

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## [1] 0.7321429
```

5. $P(Competent|CC-CPR) = P(Competent \cap CC-CPR)/P(CC-CPR) = (15/56)/(29/56) = 15/29 = 0.5172$

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15/29
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## [1] 0.5172414
```

Question 2

$P(age > 30 \cup master's\ degree) = P(age > 30) + P(master's\ degree) - P(age > 30 \cap master's\ degree) = 15/25 + 8/25 - 2/25 = 21/25 = 0.8400$

```
21/25
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## [1] 0.84
```

Question 3

The definition of a conditional probability is given as

$$P(B|A) = \frac{P(B \cap A)}{P(A)};\ P(A) \neq 0$$

If we specify events B and A to be {allergy} and {exposed}, respectively, and solve for $P(exposed)$, we get:

$$P(exposed) = \frac{P(allergy \cap exposed)}{P(allergy|exposed)} = \frac{0.6}{0.8} = 0.7500$$

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0.6/0.8
```

```
## [1] 0.75
```

THE END