A/P Quiz Solutions for the First Half of the Semester

A/P Q#1
1/14
3 pts.
Complete the truth table for the proposition \((p \land q) \rightarrow p\)

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<td>q</td>
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<td>(p \land q) \rightarrow p</td>
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- \(p \land q\) is True when both \(p\) and \(q\) are True and is False otherwise.
- \(p \rightarrow q\) is False when \(p\) is True and \(q\) is False and is True otherwise.

\[\vdash (p \land q) \rightarrow p\] is True always and is a tautology.

A/P Q#2
1/27
3 pts.
Quiz #2A: Anne and Jim are going to a restaurant for dinner.
On the menu are 5 salads and 8 entrees.
A. Anne decides to have only one item, either a salad or an entrée. How many choices does she have? Anne has 5 + 8 = 13 choices.
B. Jim is going to have both a salad and an entrée. How many choices does he have? There are 2 operations: \(O_1\): choose a salad, \(O_2\): choose an entrée, with possible outcomes \(N_1=5\) and \(N_2=8\). Using the multiplication principle, \(5 \times 8 = 40\), Jim has 40 choices.

Answers: Quiz 2B: 13, 36 Quiz 2C: 14, 45 Quiz 2D: 12, 32

A/P Q#3
2/4
3 pts.
Refer to the Venn Diagram for events A and B in an equally likely sample space \(S\) with 100 simple events. Find each of the probabilities below.

\[S\]
\[A\]
\[B\]
\[30\]
\[15\]
\[45\]
\[10\]

A. \(P(A \cup B) = .30 + .15 + .45 = .9\)
B. \(P(A \cap B') = .3\)
C. \(P(A \cup B') = .45 + .4 - .3 = .55\)
D. \(P((A \cup B)') = .10\)

A/P Q#4
2/9
3 pts.
Find the following:

\[P(G) = 0.5\] (read from tree)
\[P(T|G) = .92\] (read from tree)
\[P(G \cap T) = (0.5)(.92) = 0.46\]
\[P(T) = P(G \cap T) + P(G' \cap T) = (.5)(.92) + (.5)(.12) = 0.46 + 0.06 = 0.52\]
If the population in a particular country is growing 1.7% compounded continuously, how long will it take the population to double?

Use the Continuous Compound Interest Formula - CCI:

\[ A = P e^{rt} \]
\[ 2 = 1 \cdot e^{0.017t} \]
\[ \ln 2 = \ln e^{0.017t} \]
\[ \ln 2 = 0.017t \]
\[ t = \frac{\ln 2}{0.017} \]
\[ t = 40.773 \text{ years} \]