Errata and updates for ASM Exam P Manual (Third Edition Fourth Printing) sorted by page

[2/11/2022] On page xi, two lines after the second displayed line, change "sum of difference" to "sum or difference".

[5/30/2021] On page 12, in the solution to exercise 1.6, change the second to last line to

$$(A \cup B) \cap (A \cup B') = A \cup (B \cap B') = A \cup \varnothing = A$$

[5/30/2021] On page 13, in the solution to exercise 1.6, change the second to last line to

$$(A \cup B) \cap (A \cup B') = A \cup (B \cap B') = A \cup \varnothing = A$$

[2/11/2022] On page 22, in the sidebar, replace the last sentence with

> The sum approaches $1 - 1/e$ as $n \to \infty$. So the probability that none of n get their own hat converges to $1/e$ as $n \to \infty$.

[5/21/2021] On page 24, on the last 2 displayed lines in the sidebar, change the index i to m and change $(-1)^{n-1}$ to $(-1)^{m-1}$ in each of them.

[1/6/2021] On page 32, in the solution to exercise 2.25, on the third line, change "third sock" to "fourth sock" and change "3 mathching out of 5" to "3 matching out of 5".

[8/5/2021] On page 229, replace the solution to exercise 18.2 with

There is a 1/5 probability that a 5 appears on the first roll, given that 6 did not appear on the first roll. If a 5 is not obtained on the first roll, we must wait until after two rolls, since the second roll is 6. At any point of time, the expected number of rolls until the next 5 is six, as discussed below. So after 2 rolls, the expected roll on which 5 will appear is $2 + 6 = 8$. There is a 4/5 probability that 5 does not appear on the first 2 rolls.

By the double expectation formula, the expected number of rolls is

$$\mathbf{E}[X \mid Y = 2] = \Pr(X = 1 \mid Y = 2)(1) + \Pr(X \geq 3 \mid Y = 2)(8) = 0.2(1) + 0.8(8) = \boxed{\mathbf{6.6}} \qquad \textbf{(D)}$$

One way to show that the expected number of rolls until a specific number appears is 6 is as follows. Let N be the expected number of rolls that we want. By definition of expected value

$$\begin{aligned}\mathbf{E}[N] &= \sum_{n=1}^{\infty} n \Pr(N = n) \\ &= \sum_{n=1}^{\infty} n \left(\frac{5}{6}\right)^{n-1} \left(\frac{1}{6}\right) = \frac{1}{6} \sum_{n=1}^{\infty} n \left(\frac{5}{6}\right)^{n-1}\end{aligned}$$

The sum can be evaluated as a geometric sum of geometric series:

$$\begin{aligned}\sum_{n=1}^{\infty} n \left(\frac{5}{6}\right)^{n-1} &= \sum_{m=1}^{\infty} \sum_{n=m}^{\infty} \left(\frac{5}{6}\right)^{n-1} \\ &= \sum_{m=1}^{\infty} \frac{(5/6)^{m-1}}{1 - 5/6} \\ &= 6\left(\frac{1}{1 - 5/6}\right) = 36\end{aligned}$$

So $\mathbf{E}[N] = \frac{1}{6}(36) = 6$.

[2/11/2022] On page 267, in exercise 21.17 choice A, change the expression for $y = 1, 2, 3, \ldots$ to $\dfrac{0.1^{y+1}}{(y+1)!}e^{-0.1}$.

[12/16/2020] On page 363, in the solution to exercise 28.10, on the fifth line, delete $p_1 +$.

[2/11/2022] On page 369, in exercise 29.13 choice (E), change $e^{(-0.1y)^{1.25}}$ to $e^{-(0.1y)^{1.25}}$.x

[1/18/2021] On page 466, in the solution to question 18, on the last line, remove the yellow framed box from 4250 and the answer choice (D) and add the following line:

That is the 60^{th} percentile of loss amount. The corresponding payment is **3750**. **(C)**

Also correct the answer key on page 462.