

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

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

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

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

[2/11/2022] On page 263, in exercise 21.17 choice A, change the expression for $y = 1, 2, 3, \dots$ to $\frac{0.1^{y+1}}{(y+1)!}e^{-0.1}$.

[2/11/2022] On page 359, in exercise 29.13 choice (E), change $e^{-(0.1y)^{1.25}}$ to $e^{-(0.1y)^{1.25}}$.

[8/5/2021] On page 225, 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

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

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

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

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

[5/21/2021] On page 22, 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.

[1/18/2021] On page 452, 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 60th percentile of loss amount. The corresponding payment is 3750. (C)

Also correct the answer key on page 448.

[1/6/2021] On page 29, in the solution to exercise 2.25, on the third line, change “third sock” to “fourth sock” and change “3 mathcing out of 4” to “3 matching out of 5”.

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

[10/18/2020] On page 16, in the solution to exercise 1.22, on the fourth line, add a left parenthesis before $0.4 - 2d$).

[10/18/2020] On page 39, in the solution to exercise 3.14, on the first line, change $P(E \cup F)$ to $P(E \cap F)$.

[10/18/2020] On page 270, in the solution to exercise 21.22, on the last line, change $\lambda e^{-\lambda}$ to $\lambda e^{-\lambda}$.

[10/18/2020] On page 271, in the solution to exercise 21.27, change the third displayed line to

$$\frac{1}{3} \left(-3e^{-3} - (e^{-\lambda}) \Big|_0^3 \right)$$

[10/18/2020] On page 285, in the solution to exercise 22.12, on the second displayed line, change $5e^{-10/5}$ to $15e^{-10/5}$.

[10/18/2020] On page 303, in the solution to exercise 23.15, on the first line, put a right parenthesis after the first $1.2X_2$; change $\Pr(X_1 > 1.2X_2)$ to $\Pr(X_1 > 1.2X_2)$.

[10/18/2020] On page 461, in the solution to question 16, on the third line, change $F_{Y|X}(y | x)$ to $f_{Y|X}(y | x)$.

[8/12/2020] On page 238, in exercise 19.12, in answer choices (B) and (D), change $1 - ep^2$ to $1 - 3p^2$.

[8/3/2020] On page 154, in the solution to exercise 12.24, change the second and third lines to assuming $0 \leq x \leq b$,

$$\Pr(X \leq x) = 0.75 \Pr(X \leq x | X \leq b) = 0.75 \left(\frac{x}{b} \right)$$

[7/13/2020] On page 64, in exercise 5.15, replace the five answer choices with

- (A) $\frac{(x-1)(11-x)(12-x)}{495}$
- (B) $\frac{(x-1)(11-x)(12-x)}{990}$
- (C) $\frac{(x-1)(2-2)(12-x)}{990}$
- (D) $\frac{(x-1)(x-2)(12-x)}{495}$
- (E) $\frac{(10-x)(11-x)(12-x)}{495}$

[7/13/2020] On page 64, in exercise 5.16, replace answer choice (B) with

$$e^{-\lambda y}(e^{\lambda} - 1), y = 1, 2, 3, \dots$$

[7/13/2020] On page 68, in the solution to exercise 5.16, replace the last line with

$$= e^{-\lambda y}(e^{\lambda} - 1) \quad \text{(B)}$$