

Errata and updates for ASM Exam MFE/3F (Ninth Edition) sorted by date

Note the corrections to Practice Exam 6:9 (page 613) and 10:18. None of the answer choices is correct for Practice Exam 10:15.

[2/21/2017] On page 261, in the introductory box for exercises 12.8 and 12.9, in (i), add “%.” after 4.

[2/21/2012] On page 256, in Example 12G(i), add “%.” after 26.

[2/21/2012] On page 258, on the fourth line, add “%.” after 10.

[2/21/2012] On page 264, in exercise 12.22(iv), add “%.” after 5.

[2/21/2012] On page 318, in the solution to exercise 13.29, on the last line, change the exponent to -0.05 .

[1/25/2012] On page 420, in the solution to exercise 19.7, the expression for V_t on the second line should have $S(t)^{0.5}$ instead of $S(t)$, so

$$V_t = 0.055S(t)^{0.5} e^{0.055t}$$

Similarly, on the fourth line, change the term before the equals sign to $0.055S(t)^{0.5} e^{0.055t}$.

[1/21/2012] On page 56, on the last line of the page, change $109e^{0.1}$ to $109e^{-0.1}$.

[1/17/2012] On page 403, on the second line of the answer to Example 18F, change $\frac{d^2Z(t)}{dt^2}$ to $\frac{d^2X(t)}{dZ(t)^2}$.

[1/15/2012] On page 397, in the solution to exercise 17.9, on the fifth line, change “then Z_2 ” to “then Z_3 ”. A more accurate version of the sentence is

... then Z_3 is a Brownian motion with variance equal to the sum of the variances of $0.24Z_1'$ and $0.1Z_2 \dots$

[1/13/2012] On page 93, in exercise 4.27 on the second line, change the upper-case in futures to lower-case.

[12/1/2011] On page 54, on the last line of the page, change “borrow” to “lend”.

[11/29/2011] On page 271, in the solution to exercise 12.11, on the fifth line, delete the first “is”. Put a negative sign before $N(-d_1)$. On the sixth line, delete one of the negative signs in the exponent of e^{-r} .

[11/15/2011] On page 789, on the first line of the solution to question 28, change “put” to “call”.

[11/10/2011] On page 678, the solution to question 15 is incorrect. The correct solution is

The prepaid forward price of currency, as indicated in Table 1.2, is

$$x_t e^{-r_f(T-t)}$$

Here, for dollars in terms of euros, $x_t = 1/1.50$ and dollars are the foreign currency so $r_f = 0.04$. Also, $T - t = 2$. We conclude that the prepaid forward price is $100e^{-0.04(2)}/1.50 = \boxed{61.54}$.

[11/9/2011] On page 472, on the 7th displayed line of the page, there should be a dt at the end of the line, so that the line looks like this:

$$dX(t) = (-\lambda X(t)e^{-\lambda t} + \alpha \lambda e^{-\lambda t}) dt + e^{-\lambda t} d\left(\int_0^t \sigma e^{\lambda s} dZ(s)\right) - \left(\lambda e^{-\lambda t} \int_0^t \sigma e^{\lambda s} dZ(s)\right) dt$$

[11/9/2011] On page 486, on the last line of the warning box, change “year n ” to “year k ”.

[11/5/2011] On page 363, in the exercise 15.1(v), the word after “risk-free” should be “interest”.

- [11/5/2011] On pages 773–774, in the solution to question 15, the payoffs should be discounted at 0.02. The multiplication by $e^{-0.02}$ may be postponed to the end, however, since multiplying the five payoffs by $e^{-0.02}$ will multiply the standard deviation by $e^{-0.02}$. Therefore, replace the last phrase of the solution, “then take the square root...” with “then take the square root and multiply by $e^{-0.02}$ to get the standard deviation of the call option price, $e^{-0.02}\sqrt{0.000020272} = \mathbf{0.0044}$ ”. None of the five answer options are correct.
- [11/4/2011] On page 613, in question 9(iv), the right side of the equation should be $e^{0.2952t}$.
- [11/4/2011] On page 727, in the solution to question 15, the column S_t/S_{t-1} is incorrect, except that 1.0025 is correct. The five entries in that column should be 1.0025, 1.0948, 0.9180, 0.9429, 1.0579.
- [11/3/2011] On page 135, in the solution to exercise 6.3, on the last line, change $>$ to $<$.
- [11/3/2011] On page 220, in the solution to exercise 10.6, the final answer is missing a negative sign and should be -0.52757 .
- [11/2/2011] On page 156, in the solution to exercise 7.2, on the first line, change “lognormal” to “normal” in two places.
- [11/1/2011] On page 704, in the solution to question 6, 3 lines from the bottom of the page, change the 0.09531 in the denominator to 0.125.
- [10/30/2011] On page 464, in the solution to exercise 22.15, 2 lines from the bottom of the page, change the r in the exponent to α .
- [10/26/2011] On page 546, on the last line of exercise 26.38, delete the phrase “, using a negative sign to indicate a sale”, and delete the negative signs in the five choices.
- [10/26/2011] On page 555, in the solution to exercise 26.38, on the third displayed line, delete the negative sign before 1.64065. On the fifth displayed line, put a negative sign before 0.74177. On the next line, delete the negative sign before 1.9247. On the last line, replace “sell” with “buy”.
- [10/26/2011] On page 656, question 18 is defective. In (iii), change 0.07 to 0.05. Divide all the answer choices by 10, so that they are 0.01, 0.015, 0.02, 0.025, and 0.03.
- [10/26/2011] On page 774, correct the solution to question 18 (in accordance with the revised question) as follows:

- On the fourth displayed line, change 0.07 to 0.05.
- The last two lines should read:

$$\begin{aligned}
 -0.05\sigma^2 - 0.01 + 0.02 &= 0 \\
 \sigma^2 &= \mathbf{0.02} \quad (\text{C})
 \end{aligned}$$

- [10/25/2011] On page 492, in exercise 24.20, in the graph, replace “Month 5” with “Month 6”.
- [10/22/2011] On page 510, in the solution to exercise 25.3, on the second to last line, put a negative sign in front of 0.10433: $N(-0.10433)$.
- [10/17/2011] On page 412, four lines below equation (19.1), change $(r - \delta)C$ to $(r - \delta_C)C$.
- [10/10/2011] On page 844, the answer key for question 69 should be (C) rather than (A).
- [10/9/2011] On page 414, on the third line in the S^a paragraph, add an a before $r - \delta$:

$$0.5a(a - 1)\sigma^2 S^a + a(r - \delta)S^a = rS^a$$

- [10/9/2011] On page 454, 5 lines above Quiz 22-1, add dt at the end of the line.

- [10/5/2011] On page 223, in the solution to exercise 10.18, on the eighth line, delete -1 from the right hand side.
- [10/5/2011] On page 390, on the fifth line, the paragraph should start “The time- t value of a geometric ...” Add a hyphen after “time”, delete “nbd”, and move t after the hyphen.
- [10/2/2011] On page 145, two lines after the answer to Example 7B, change $\mu = 0.14$ to $\mu = 0.15$. On the second line of the paragraph beginning “You will notice”, change $e^{0.14}$ to $e^{0.15}$ and change 46.01 to 46.47. Change 46.01 to 46.47 on the next line as well. On that line, change $40e^{0.14-0.3^2} = 42.05$ to $40e^{0.15-0.3^2} = 42.47$. On the fourth line, change $40(e^{0.14+0.5(0.3^2)}) = 48.13$ to $40(e^{0.15+0.5(0.3^2)}) = 48.61$. On page 146, in the caption for Figure 7.1, change $\mu = 0.14$ to $\mu = 0.15$.
- [10/2/2011] On page 694, the answer key for question 5 should be **(D)**. Correct the answer key on page 692 as well.
- [10/2/2011] On page 707, the answer key for question 19 should be **(B)**. Correct the answer key on page 703 as well.
- [9/27/2011] On page 168, on the first line of Table 8.2, change x_i to S_i .
- [9/27/2011] On page 169, change the first sentence of exercise 8.3 to
A stock’s price follows a lognormal model.
- [9/27/2011] On page 217, in exercise 10.19, replace (vii) with
The risk premium is positive.
- [9/27/2011] On page 223, in the solution to exercise 10.19, on the last line, replace “where we used ... since the risk-free rate is nonnegative” with “We used -0.62 since using 0.62 results in an r greater than 0.19 , making the risk premium negative.”
- [9/27/2011] On page 273, in the solution to exercise 23, replace the first two expressions in the displayed line with
- $$\Gamma_d = \frac{\Delta_{du} - \Delta_{dd}}{S_{du} - S_{dd}}$$
- [9/27/2011] On page 391, on the second displayed line of the answer to Example 17A, the first expression should be
- $$\Pr\left(\ln \frac{S(t)}{S(0)} > \ln 1.05\right)$$
- [9/27/2011] On page 499, in the solution to exercise 24.20, on the second to last line, replace 0.965523 with 0.983570. On the last line, replace 0.965523 with 0.983570 and replace the final answer 0.9681 with 0.9758.
- [9/27/2011] On page 515, on the third displayed line of Section 26.1, the one ending with (*), change $P(t, t, T)$ to $P(r, t, T)$. Also, put a 0.5 factor in front of $(T - t)^2$.
- [9/27/2011] On page 516, put a 0.5 factor before the expression under the brace with ①.
- [9/27/2011] On page 516, in the table of the answer to Example 26A, on the second line under the heading, change -2.608047 to -2.608074 .
- [9/27/2011] On page 530, on the third line of Subsection 26.3.2, change “rats” to “rates”.
- [9/27/2011] On page 693, the answer key for question 3 should be **(A)** Correct the answer key on page 692 as well.
- [9/7/2011] On page 261, in exercise 12.6(vi), add “%.” at the end of the line.
- [9/7/2011] On page 405, in exercise 18.9, on the third line from the end, change $T - t$ to $1 - t$.
- [9/7/2011] On page 408, the solution to exercise 18.9 has several errors. The correct solution is

The Itô process for $X(t)$ is

$$\frac{dX(t)}{X(t)} = (r - r_f)dt + \sigma dZ(t) = (0.03 - 0.08)dt + 0.15 dZ(t)$$

Since $Y(t) = F_{t,1}^P(X(t)) = X(t)e^{-0.08(1-t)}$, by Itô's lemma, we have

$$\begin{aligned} dY &= e^{-0.08(1-t)}dX(t) + 0.08Y dt \\ &= e^{-0.08(1-t)}(-0.05X(t)dt + 0.15 dZ(t)) + 0.08Y dt \\ &= -0.05Y dt + 0.15Y dZ(t) + 0.08Y dt = 0.03Y dt + 0.15 dZ(t) \end{aligned}$$

so $\mu(t, Y(t)) = \boxed{0.03}$.

[8/30/2011] On page 6, third line, change 's to seller's.

[8/27/2011] On page 387, the solution to exercise 16.7 is incorrect. The correct solution is

Let $X(t)$ be the exchange rate, and $Y(t) = \ln X(t)$. Logging the expression we're given,

$$Y(t) = Y(0) + 0.005t + 0.1Z(t)$$

so $Y(5)$ is a normal random variable with mean $\ln X(0) + 0.005(5) = \ln 0.9 + 0.025$ and variance $(0.1^2)(5) = 0.05$. The probability that $X(t)$ is less than 1, or $Y(t)$ less than 0, is

$$N\left(\frac{0 - (\ln 0.9 + 0.025)}{\sqrt{0.05}}\right) = N(0.35938) = \boxed{0.64035}$$

[8/26/2011] On page 454, 2 lines above Quiz 22-1, replace Y at the end with dt and put a dt after the second summand, so that the line reads:

$$\frac{dY}{Y} = \frac{aS}{S}((\alpha - \delta)dt + \sigma dZ(t)) + 0.5a(a - 1)\sigma^2 dt - (a(r - \delta) + 0.5a(a - 1)\sigma^2)dt$$

[8/23/2011] On page 388, the solution to Quiz 16-3 is incorrect. The correct solution is

$\ln(X(t)/X(0)) = 0.05t + 0.3Z(t)$ is an arithmetic Brownian motion. By memoryless properties of Brownian motion, the distribution of $\ln(X(2.5)/30)$ is normal with mean $0.05(0.5) = 0.025$ and variance $(0.3^2)(0.5) = 0.045$. The probability of $30 \leq X(t) \leq 33$ is

$$\begin{aligned} \Pr(30 \leq X(t) \leq 33) &= N\left(\frac{\ln 33/30 - 0.025}{\sqrt{0.045}}\right) - N\left(\frac{\ln 30/30 - 0.025}{\sqrt{0.045}}\right) \\ &= N(0.33145) - N(-0.11785) \\ &= 0.62985 - 0.45309 = \boxed{0.17676} \end{aligned}$$

[8/20/2011] On page 268, in the box before question 12.39, (iii) and (iv) are cut off. (iii) should finish "5% per annum" and (iv) should finish "20% per annum".

[8/20/2011] On page 278, in the solution to question 12.39, if 5-place rounding of the normal distribution function is used, then $N(d_1) = 0.53206$ and the final answer is 46,794 shares. The solution to question 12.40 with 5-place rounding is as follows:

In this question, they didn't want you to include the changes of prices of the stock in the cost; they ask for the cost of the hedge, not the cost of the instrument that is being hedged.

The values of d_1 that are provided are rounded to 2 decimal places. We will use them, but we will calculate the normal distribution to 5 decimal places.

$N(-0.10) = 0.46017$, and $N(-0.05) = 0.48006$. Initially we buy 46,794 shares. After 1 week, we need 46,017 shares so we sell $46,017 - 46,794 = 777$ shares. After 2 weeks we need 48,006 shares so we buy $48,006 - 46,017 = 1989$ shares. Each week's purchase or sale is at the week's stock price. These purchases are then accumulated at interest for 2 weeks, 1 week, or 0 weeks. The following table summarizes the calculation of the cost of the hedge:

Total Shares	Shares Purchased	Stock Price	Interest Factor	Accumulated Cost
46,794	46,794	49.16	1.001925	2,304,821
46,017	-777	49.33	1.000962	-38,366
48,006	1,989	49.09	1	97,640
				2,364,095

The interest factors in this table were computed as $e^{0.05(2)/52} = 1.001925$ and $e^{0.05/52} = 1.000962$. The final column is the product of shares purchased, stock price, and interest factor. The accumulated cost of the hedge is **2,364,095**.

[8/19/2011] On page 442, on the first displayed line in the answer to Example 21C, change $0.3 dZ(t)$ to $0.2 dZ(t)$ in two places.

[8/19/2011] On page 443, in Example 21D(ii), change $S(0) = 10$ to $S(0) = 40$.

[8/17/2011] On page 43, in the enumerated list at the bottom of the page, item 1, change $S - K_1$ to $S - K_2$.

[8/17/2011] On page 294, on the second line of the page, change 45.5 to 45 and change 4.5923 to 4.5968. On the eighth line, change 4.5923 to 4.5968.

[8/13/2011] On page 214, in exercise 10.6(ii), change the dividend yield from 0.05 to 0.06.

[8/5/2011] On page 135, the solution to exercise 6.4 is incorrect. The correct solution is

The gain in exercising is the gain in dividends on the stock, or $S(1 - e^{-0.06}) = 0.058235S$. The loss is the loss in interest on the strike price, $50(1 - e^{-0.04}) = 1.96053$, plus the loss of the implicit put. Calculate the gain and loss starting at 64 and working down:

Stock price	Dividend gain	Interest and put loss
64	$64(0.058235) = 3.72707$	$1.96053 + 1.6 = 3.56053$
63	$63(0.058235) = 3.66883$	$1.96053 + 1.7 = 3.66053$
62	$62(0.058235) = 3.61060$	$1.96053 + 1.8 = 3.76053$

When the stock price is 62, it is not optimal to exercise, since the loss is greater than the gain. We don't know what the put's price is when the stock price is between 62 and 63, but it is worth at least 1.7. So the gain is definitely larger than the loss when $0.058235S > 1.96053 + 1.7$, or $S = 3.66053/0.058235 = 62.858$. The lowest price for which it may be optimal to exercise the option is **62.858**.

[7/22/2011] On page xi, on the first line of the second paragraph under "The normal distribution table", add "use" after "you may".

[7/22/2011] On page xii, replace the first line with

http://www.beanactuary.org/exams/preliminary/register/Regpdf/MFE3F_Table.pdf

[7/5/2011] On page 60, in exercise 3.5, delete the period at the end of the first line and add “having a period of 6 months. Also on the second-to-last line, after “stock”, add “expiring in 6 months”.

[5/24/2011] On page 629, in question 28, replace the first sentence with

Let $S(t)$ be the time- t value of a stock index, and $Q(t)$ the time- t value of an annuity contract. The annuity’s contract value grows at the same rate as the value of the stock index, except that a continuously compounded 1% management fee is assessed. More precisely,

$$Q(t + dt) = Q(t) \left(\frac{S(t + dt) - 0.01S(t)dt}{S(t)} \right)$$

[5/22/2011] On page 556, in the solution to exercise 26.39, on the second line, the exponent is based on the formula in McDonald, but McDonald’s formula is erroneous; there should be a negative sign before $0.5\sigma\phi(5^2)$. This has no effect on the solution since $\phi = 0$. Since McDonald has not corrected this error, it is unlikely you would be expected to know the correct formula.