Explaining Logarithms, Errata

First Edition Bound Copy, 2006 (White Cover)

Page 17 bound copy.

In the middle of the page the following text:

“Here we can go no further… In a later chapter, we will learn how to solve for an exponent in such an equation as this where the base is not 10.”

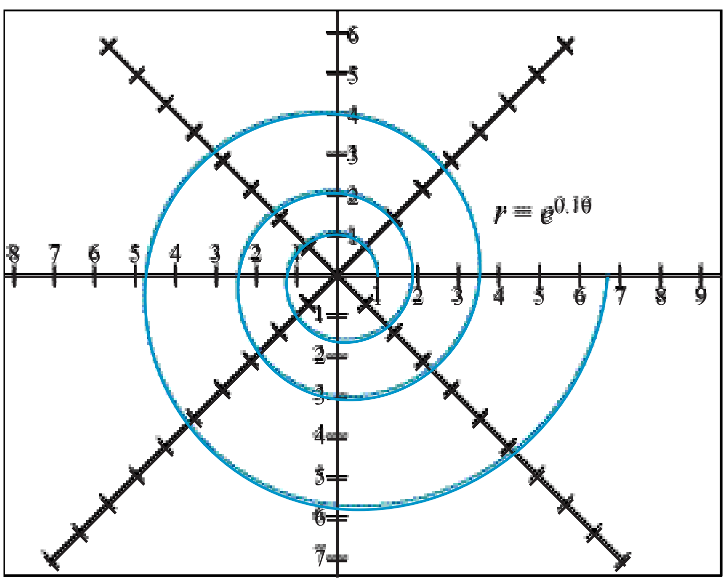
Corrects to the following:

“Here we can go no further…In a later chapter, we will learn how to solve for an exponent in such an equation as this ***where this precondition is not required***.”

Pages 34 and also pg. 37 bound copy.

The figure of the “logarithmic spiral” is currently labeled $r = e^{0.01}$

This figure should be labeled $r = e^{0.01 * theta}$



Errata continues next page

Pg. 35 (bottom page)

$\sqrt[5]{b^3} = b^{5/3}$ should be $\sqrt[5]{b^3} = b^{3/5}$

Pg. 42 errata (mid page)

But since e = 2.71828 … and $e^{0.05}$ = 1.051271096 it appears that

$$\left(\frac{1+0.05}{1,000,000}\right)^{1,000,000} = 1.05127109 \text{ (from the table above)} \approx e^{0.05}$$

By transitive

$$\left(\frac{1+0.05}{1,000,000}\right)^{1,000,000} = e^{0.05}$$

In other words $\left(1+\frac{r}{k}\right)^k = e^r$

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Errata continued next page.

Page 45 bound copy.   The cut and paste gremlin really got me here on pg. 45.

At top the following text:

b.)   Use the work in part a.) to predict how many bacteria there will be on Saturday (5 days from the start of the experiment).

$f \quad = \quad i \times 6^{kt}$ same formula

$4{,}500 \quad = \quad 2{,}000 \times 6^{(0.2262943855 \times 5)}$ substitution of given information into the formula

$\frac{4{,}500}{2{,}000} \quad = \quad 2{,}000 \times 6^{1.131471928}$

$\log\left(\frac{9}{4}\right) \quad = \quad 2{,}000 \times 7.59375$

$\log 2.25 \quad = \quad 15{,}187$bacteria per square millimeter

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b.)   Use the work in part a.) to predict how many bacteria there will be on Saturday (5 days from the start of the experiment).

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$= \quad 2{,}000 \times 6^{1.131471928}$

$= \quad 2{,}000 \times 7.59375$

$=$ **15,187bacteria per square millimeter**

Errata continued next page

pg. 50 Bound Copy (top of page)

Take a line segment (1 dimension) and divide it into halves. There are two equal subparts.

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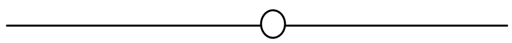
Take a line segment (1 dimension) and divide it into halves. There are two equal subparts.



Page 64 bound copy at the top

Check it out ($\frac{4}{5}$ = 0.8):

$$\ln 5 \approx (0.8)^1 + \frac{1}{2}(0.8)^1 + \frac{1}{3}(0.8)^3 + \frac{1}{4}(0.8)^4 + \frac{1}{5}(0.8)^5 + \frac{1}{6}(0.8)^6$$

Should be corrected to:

Check it out ($\frac{4}{5}$ = 0.8):

$$\ln 5 \approx (0.8)^1 + \frac{1}{2}(0.8)^2 + \frac{1}{3}(0.8)^3 + \frac{1}{4}(0.8)^4 + \frac{1}{5}(0.8)^5 + \frac{1}{6}(0.8)^6$$

Errata continued next page

Pg. 85, bottom middle   I must have been brain dead when I made this blooper.
It is really bad!   Change the following "insert box."

By visualizing vertical asymptotes at $x = –1$ and $x = 4$, we notice that whenever $y = x^2 – 3x – 4 < 0$ $(–1 < x < 4)$ the log curve $y = \log (x^2 – 3x – 4)$ is undefined. That makes sense as the log function is only defined for when the log argument > 0 (Chap. 2 remember?). So we conclude that $\log_5 (x^2 – 3x – 4)$ implies that $x^2 – 3x – 4 > 0$. Therefore $(x + 1) (x – 4) > 0$ which is only true when $x < –1$ and $x > 4$.

However, the original domain for the identity $\log_5 (x + 1) + \log_5 (x – 4) = \log_5 (x^2 – 3x – 4)$ is $x > 4$ [$\{x > –1\} \cap \{x > 4\} = \{x > 4\}$, remember?] so reject $x < –1$ for the identity.

Correction, the text and fig. above needs to be changed to the following:

By visualizing vertical asymptotes at $x = –1$ and $x = 4$, we notice that whenever $y = x^2 – 3x – 4 < 0$ $(–1 < x < 4)$ the log curve $y = \log (x^2 – 3x – 4)$ is undefined. That makes sense as the log function is only defined for when the log argument > 0 (Chap. 2 remember?). So we conclude that $\log_5 (x^2 – 3x – 4)$ implies that $x^2 – 3x – 4 > 0$. Therefore $(x + 1) (x – 4) > 0$ which is only true when $x > -1$ and $x > 4$ (or when $x < -1$ and $x < 4$)

$\{x > –1\} \cap \{x > 4\} = \{x > 4\}$ so reject $x > –1$ for the domain of the identity.