Errors in the Exercises

Each item below lists an exercise or a part of an exercise and then describes the error. Then a corrected version of the exercise is provided. In the corrected version, anything that is different from the exercise in the textbook is highlighted in color for emphasis.

1.1.4 (j.) The independent variables do not match.

Corrected Exercise: \( h(z) = (z^2 + 1)^8 (z + z^3)^4 (z^2 - z^6)^9 (z^3 - z^5)^5 \)

1.2.1 (f.) \( \frac{7}{21} \) is not a reduced fraction.

Corrected Exercise: \( p(x) = \frac{5}{21} x + \frac{1}{3} \); vertical stretch by a factor of 6.

1.2.4 (d.) The independent variables do not match.

Corrected Exercise: \( p(t) = \ln(\frac{1}{e^t}) \)

1.2.4 (e.) The independent variables do not match.

Corrected Exercise: \( q(t) = e^{t-3} \)

1.2.4 (g.) The independent variables do not match.

Corrected Exercise: \( T(z) = 2\sqrt{z} + 3 \)

1.2.9 (c.) \( f(x) + -9 \) doesn’t make any sense.

Corrected Exercise: Find a point on the graph of \( y = f(x) - 9 \).

1.2.12 The horizontal axis of the graph should be labeled with a \( t \) instead of an \( x \).

Corrected Exercise: Dave runs a pizza shop and he’s been tracking the value of his inventory over time. He expects that \( t \) days from now his inventory will be worth \( I(t) \) dollars. The graph of \( y = I(t) \) is shown below.

The insurance company requires that Dave must keep \$250 plus ten percent of the value of his inventory in the safe in his shop at all times. Let \( V(t) \) be the amount of money he needs to have in his safe \( t \) days from now.

(a.) Write \( V \) as a transformation of \( I \).

(b.) Sketch the graph of \( y = V(t) \).

1.3.9 (f.) The problem works fine the way it is but it was intended to be a horizontal transformation instead of a vertical transformation. There won’t be a correction; just think of it as a review question from the previous section.
1.3.9 (g.) The problem works fine the way it is but it was intended to be a horizontal transformation instead of a vertical transformation. There won’t be a correction; just think of it as a review question from the previous section.

1.3.10 The horizontal axis of the graph should be labeled with a \( t \) instead of an \( x \).

**Corrected Exercise:** A researcher working in a mountain town predicts that if \( t \) is the ambient temperature outside (in degrees Fahrenheit) then they should expect \( S(t) \) inches of snowfall that day. The graph of \( y = S(t) \) is shown below.

Let \( C \) be the function defined as follows: \( C(t) \) is the expected snowfall when the temperature is \( t \) degrees Celsius above freezing.

(a.) Write \( C \) as a transformation of \( S \).

(b.) Sketch the graph of \( y = C(t) \).

1.3.11 The graph doesn’t make any sense as it’s drawn. The \( y \)-values should go from \(-12\) to \(18\) instead of \(-12000\) to \(18000\) and the \( A \) values should go from \(0\) to \(80000\) instead of \(0\) to \(8000\).

**Corrected Exercise:** A football coach theorizes that the capacity of his stadium affects the outcome of his home games. He thinks that a capacity of \( A \) people in his stadium is worth \( P(A) \) points for his team. The graph of \( y = P(A) \) is shown below:

Define \( Q(r) \) to be the number of points in favor of the home team when the stadium is \( r \) percent full. Assume that the maximum capacity of the stadium is 80000.

(a.) Write \( Q \) as a transformation of \( P \).

(b.) Sketch a graph of \( y = Q(r) \).

1.4.10 First, \( S(d) \) should not be in “thousands of phones,” but rather just “phones.” Additionally, the fourth bullet point claims that each phone is worth $300 in profit but \( R(d) \) is defined to be the revenue from the sales of the phone. Both of those words should be “revenue.” Finally, part (B.) asks for the graph of \( y = S(d) \) (which is the function given in the problem) and it should ask for \( y = R(d) \).

**Corrected Exercise:** An electronics company is releasing a new cell phone on January first.

- Market research predicts that sales from retail stores will total \( S(d) \) phones \( d \) days after January first. Assume this model is accurate for \( 0 \leq d \leq 90 \).
The company expects additional sales from their online store. They project that they will sell about 70% online as they do in retail stores.

In addition to the online and retail sales, there were 2000 phones pre-ordered before the phone’s release.

The company expects to make $300 in revenue from the sale of each phone.

The graph of \( y = S(d) \) is shown below.

The company, due to time constraints, pushes the entire schedule back by 30 days. Let \( R \) be a function such that \( R(d) \) is the total amount of revenue that the company makes from all of their phone sales (online, presale, and retail) \( d \) days after January first.

(a.) Write \( R \) as a transformation of \( S \).

(b.) Sketch the graph of \( y = R(d) \).

1.4.11 The first paragraph should be deleted.

**Corrected Exercise:** A particular toy has become more popular than expected during the holiday season and the company who produces it needs to increase its production levels in December. Most years the production schedule demands that they’ve produced \( P(t) \) total toys \( t \) days after December 1st.

(a.) One suggestion is that they produce an extra 500 toys in November so that their expected production level is always 500 toys higher than normal. Find a function \( Q \) which reflects this plan.

(b.) Another suggestion is that they demand 40% higher production levels throughout the entire month. Find a function \( R \) which reflects this plan.

(c.) A third suggestion is that they get an early jump on producing the December supply by moving the schedule up 15 days. Find a function \( Q \) which reflects this plan.

(d.) The company actually decides to go with a production plan where they aim to produce a total of \( P(t + 3) \) toys \( t \) days after December 1st. Explain how this new plan compares with their usual plan.

1.5.1 (A.) This problem intended to ask for the graph of \( (2x)^2 + (3y)^2 = 1 \). However, the problem does make sense as it is written (and perhaps provides an extra challenge this way) so there won’t be a correction.

4.1.11 The text after the picture is supposed to be a new problem. There’s also an extra sentence at the end of the second problem which isn’t supposed to be there.

**Corrected Exercise:** *(Exercises 4.1.11 should become the following two exercises:)*

4.1.11 Find the perimeter of the shape shown below (assume that the arc is a section of a circle). Round your answer to two decimal places. *Hint: The triangle is not a right triangle but it is an isosceles triangle. Try drawing a height.*
4.1.12 Nikki’s calculator doesn’t display if it’s in degree mode or radian mode. Explain how she can tell which mode it’s in just from her calculator’s answer when she computes $\cos(3)$. 

Errors in the Content

Each item below indicates a location in the book where there is an error followed by a description of the error and a correction when appropriate. In the corrected version, anything that is different from the text in the textbook is highlighted in color for emphasis.

**Theorem 1.1.5 on page 6**: The graph on the right mistakenly identifies two of the graphs. The blue graph is the graph of $y = x^5$ and the red graph is the graph of $y = x^7$.

**Theorem 1.3.7 on page 43**: All instances of “$k$” should be replaced by “$h$.”

**Corrected Text**: Let $f$ be a function and let $h$ be a number. The graph of $y = f(x + h)$ can be obtained by horizontally shifting the graph of $y = f(x)$ by $-h$ units. If $h > 0$ then the shift is left by $h$ units and if $h < 0$ then the shift is right by $|h|$ units.

**Definition 2.4.3 on page 142**: The wording states that functions are periodic when “$f(x + p) = f(p)$” which is not the correct condition.

**Corrected Text**: Let $f$ be a non-constant function. We say that $f$ is a periodic function if there exists a positive number $p$ such that $f(x + p) = f(x)$ for all $x$ in the domain of $f$. The period of $f$ is the smallest positive value of $p$ such that $f(x + p) = f(x)$ for all $x$ in the domain of $f$. 