MTH 150 Chapter 6

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Contents

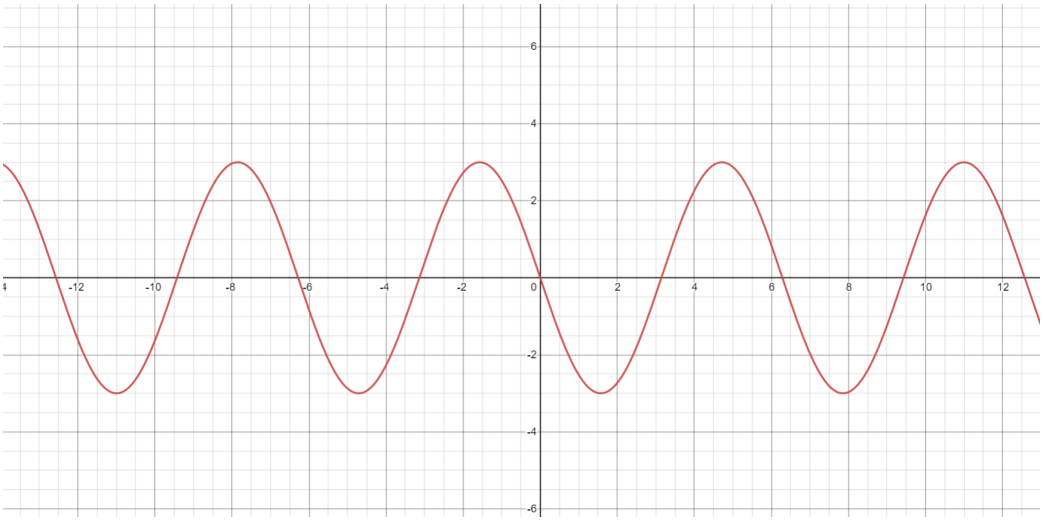
1 Reflection

I was rather happy with my work for this project. I was able to completely finish the problems in time without any stress or rushing towards the end. As for the work itself, I felt it that as it continued on, I was relying a lot on how I solved previous problems in the section as most were solved in similar ways with just new twists. While I imagine that could be said for nearly any of the chapters, I just felt like it was a lot more common here, or at least, I noticed it more here.

2 Section 6.1: Sinusoidal Graphs

2.1 Problem 1.

Answers:

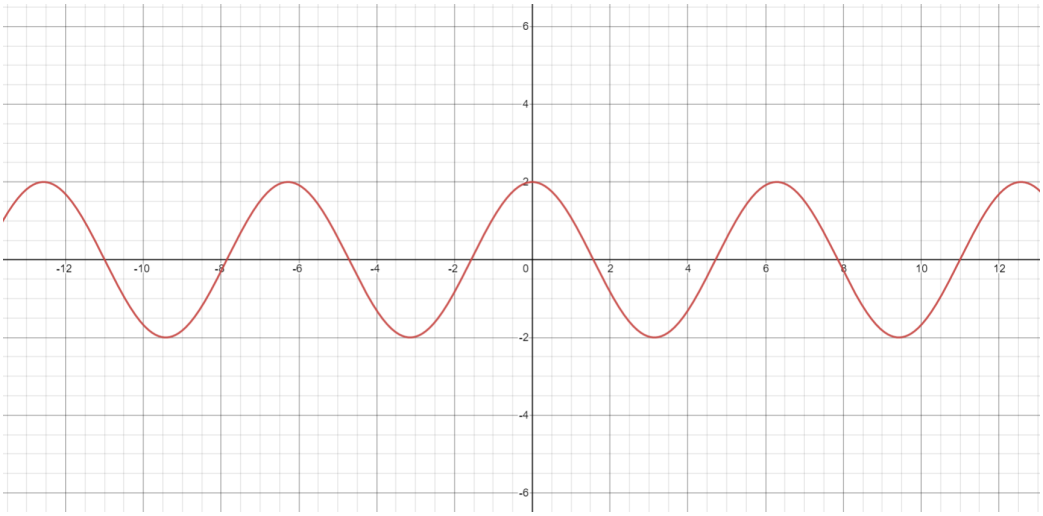


Comments

At first, as always when I start a new chapter, I was a bit confused on how to start. Though after reading through the chapter and looking at the examples, I figured out how to solve it.
To be safe, I checked my answer using the answer key, which showed my answer to be correct.

2.2 Problem 3.

Answers:



Comments

Similar to the last problem, once I figured out what I needed to do, I was able to solve the problem.
Of course, to be safe, I checked my answer using the book's answer key, which showed my answer to be correct.

2.3 Problem 11.

For each of the following equations, find the amplitude, period, horizontal shift, and midline.

Answers:

Amplitude: 3
Period=$\frac{\pi}{4}$
Horizontal Shift: 4 to the left
Midline: y=5

Comments

Took a little bit of time to properly understand, though it was easy once I got it.
I checked my answer using the book's answer key just to be safe. Which proved my answer correct.

2.4 Problem 13.

For each of the following equations, find the amplitude, period, horizontal shift, and midline.

Answers:

Amplitude: 2
Period=$\frac{2\pi}{3}$
Horizontal Shift: 7 to the right
Midline: y=4

Comments

While a bit more work than the previous problem, I didn't have any issues with it and finished it without problem. Though, as always, I checked my answer using the book's answer key, which showed my answer to be correct.

2.5 Problem 21.

Outside temperature over the course of a day can be modeled as a sinusoidal function. Suppose you know the temperature is 50 degrees at midnight and the high and low temperature during the day are 57 and 43 degrees, respectively. Assuming t is the number of hours since midnight, find a function for the temperature, D, in terms of t.

Answers:

$D(t) = 50 - 7sin(\frac{\pi}{12}t)$

Comments

Word problems often give me more trouble than I'd like to admit, and this one was no exception. After rereading through the section and retrying the problem several times, I decided to just look up the answer in the book. Thankfully, the book cleared up the steps I was suppose to take and overall, I felt like I had a better understanding after.

2.6 Problem 23.

A Ferris wheel is 25 meters in diameter and boarded from a platform that is 1 meters above the ground. The six o'clock position on the Ferris wheel is level with the loading platform. The wheel completes 1 full revolution in 10 minutes. The function h(t) gives your height in meters above the ground t minutes after the wheel begins to turn.

a. Find the amplitude, midline, and period of h(t).
b. Find a formula for the height function h(t).
c. How high are you off the ground after 5 minutes?

Answers:

a. Amplitude:12.5 , Period:10 minutes , Midline: y=13.5 meters
b. $h(t) = -12cos(\frac{2\pi}{10}t) + 13.5$
c. 26 meters

Comments

While my experience with the last problem did help here, it didn't make this problem easy by any means. This problem did take me a bit to complete. Though even when it was done, and I was checking my answers I found some mistakes.

3 Section 6.2: Graphs of Other Trig Functions

3.1 Problem 5.

Find the period and horizontal shift of each of the following functions.

Answers:

Period: $\frac{\pi}{4}$
Horizontal Shift: 8 units to the right

Comments

After reading the section, and doing the work from the previous section, I was able to complete this problem without all too many issues.
To be safe, I checked the answer key, which showed that I was correct.

3.2 Problem 7.

Find the period and horizontal shift of each of the following functions.

Answers:

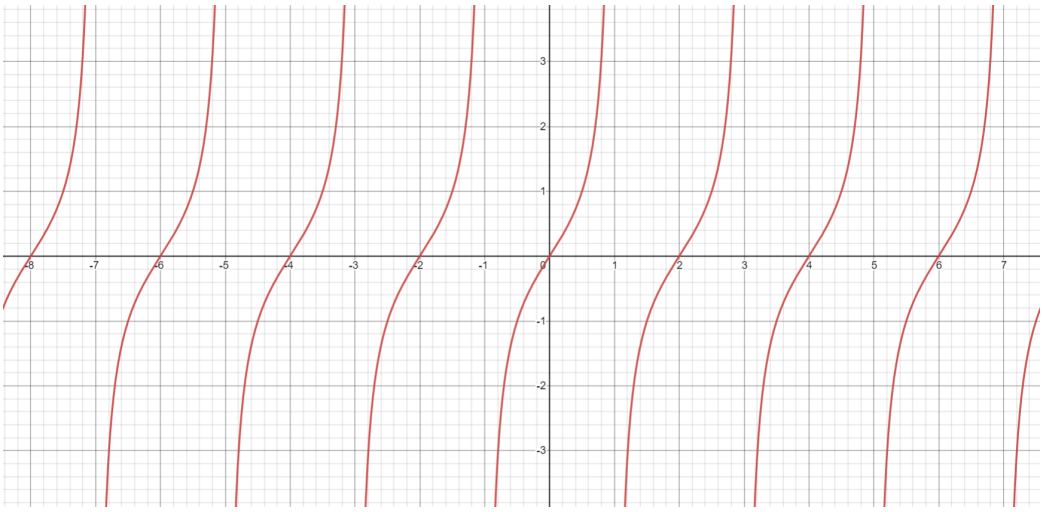
Period: 8
Horizontal Shift: 1 unit to the left

Comments

After completing the last problem, I didn't have much trouble with this one.
I checked my answer with the answer key, which confirmed that my answer was correct. Though I realized that I needed to simplify the period, which I hadn't done in my original answer.

3.3 Problem 15.

Answers:



Comments

I was a bit confused on this problem at first, and doubted my answer when I got it, though the answer key confirmed my answer. Despite how strange the graph looked to me.

3.4 Problem 21.

If tan x=1.5, find tan (x)

Answers:

1.5

Comments

Thankfully, I found this problem rather simple as it was just making the x negative, thus meaning that there was probably just a simple sign change for the answer. Which, it turned out, was.
To be sure, I checked my answer using the answer key, which showed that I was correct.

3.5 Problem 23.

If sec x=2, find sec(x)

Answers:

-2

Comments

Like the last problem I didn't have much trouble with this one. It was just another swapping of signs; conversion from positive to negative.

Of course, I checked my answer, which showed my answer to be correct. I used the answer key.

3.6 Problem 27.

Simplify each of the following expressions completely

Answers:

-csc x

Comments

Unfortunately, I had a good bit of trouble with this problem. Rereading the section only helped a little bit, though I kept getting stuck through the problem. Eventually, I looked up the answer in the answer key which helped guide me through the process of the problem.

4 Section 6.3: Inverse Trig Functions

4.1 Problem 1.

Evaluate the following expressions, giving the answer in radians

Answers:

$\frac{\pi}{4}$

Comments

While I was a little confused at first, once I got started I realized what I needed to do and was able to solve the problem.
I checked my answer using the answer key, I found that my answer to be correct.

4.2 Problem 3.

Evaluate the following expressions, giving the answer in radians

Answers:

$\frac{=}{\pi}6$

Comments

Like the last problem, once I got started, it was easy, though before that, it was a little confusing.
I checked my answer using the answer key, I found that my answer to be correct.

4.3 Problem 19.

Evaluate the following expressions

Answers:

$\frac{\pi}{4}$

Comments

While I knew how to start I kept getting stuck throughout the problem. Eventually, I just looked up the answer in the answer key. Though thankfully the answer key guided me through the problem, and how to solve it. This helped me through where I got stuck.

4.4 Problem 21.

Evaluate the following expressions

Answers:

$\frac{=}{\pi}6$

Comments

With what I learned in the last problem, I was able to complete this problem with a little bit of effort. It wasn't easy, but I was able to do it on my own without looking up the answer in the answer key.
To be sure, I used checked the answer key after I was done with the problem, it showed that my answer was correct.

5 Section 6.4: Solving Trig Equations

5.1 Problem 1.

Find all solutions on the interval

Answers:

theta=$\frac{5\pi}{4}$

theta=$\frac{7\pi}{4}$

Comments

I did find this problem to be a bit difficult. Though after reading through this section, I was able to complete it.
Upon checking my answer the first time, I saw that my answer was incorrect and I went back to find my mistake to correct it. After correcting that mistake, I got the correct answer.

5.2 Problem 3.

Find all solutions on the interval

Answers:

theta=$\frac{\pi}{3}$

theta=$\frac{5\pi}{3}$

Comments

Much like the last problem, though after my experience with the last problem, I didn't feel the need to go back to reread the section.
I checked my answer using the answer key. This showed that my answer was correct.

5.3 Problem 9.

Find all solutions

Answers:

$\frac{7\pi}{4} + 2k\pi$ or $\frac{\pi}{4} + 2k\pi$

Comments

At the beginning I was lost on how to go about solving this problem. Though after rereading this section of the chapter, I felt I began to have an understanding and tried to solve the problem. When I checked my answer, my answer proved to be incorrect, but the answer key showed me where I went wrong and how to solve problems like this.

5.4 Problem 11.

Find all solutions

Answers:

$\frac{7\pi}{6} + 2k\pi$ or $\frac{11\pi}{6} + 2k\pi$

Comments

After my work with the previous problem, I had an easier time doing this problem, and was able to complete it without much issue.
I checked my answer using the answer key, my answer was correct.

5.5 Problem 13.

Find all solutions

Answers:

theta=$\frac{\pi}{18}$ + $\frac{2k\pi}{3}$ or theta=$\frac{5\pi}{18}$ + $\frac{2k\pi}{3}$

Comments

While I didn't have much issues with the problem, I did confuse 3 theta with 30 at first.
Upon checking my answer the first time, I saw that my answer was incorrect and I went back to find my mistake to correct it. After correcting that mistake, I got the correct answer.

5.6 Problem 15.

Find all solutions

Answers:

theta=$\frac{5\pi}{12}$ + $\frac{2k\pi}{3}$ or theta=$\frac{7\pi}{12}$ + $\frac{2k\pi}{3}$

Comments

Similar story to the last problem, there wasn't much difficulty and I was careful this time not to confuse theta for 0.
I checked my answer using the answer key, which showed my answer was correct.

5.7 Problem 33.

Find the first two positive solutions

Answers:

x = 0.04829 or x = 0.47531

Comments

At the beginning I was lost on how to start on solving this problem. Though I decided to give it a shot anyway. When I checked my answer, my answer proved to be incorrect, but the answer key showed me where I went wrong and how to solve problems like this.

5.8 Problem 35.

Find all solutions

Answers:

x = 0.7381 or x = 1.3563

Comments

After my work with the previous problem, I was able to solve this one without much issue. I did make a minor math error going through it, though this was easy to fix.
I checked my answer using the answer key, my answer was correct.

6 Section 6.5: Modeling with Trigonometric Functions

6.1 Problem 7.

Outside temperature over the course of a day can be modeled as a sinusoidal function. Suppose you know the high temperature for the day is 63 degrees and the low temperature of 37 degrees occurs at 5 AM. Assuming t is the number of hours since midnight, find an equation for the temperature, D, in terms of t.

Answers:

$D(t) = -13cos(\frac{\pi}{12}(t-5)) + 50$

Comments

While this problem did take a little bit of thinking and rereading of the section, I did figure it out.
I checked my answer using the answer key in the book, which showed my answers was incorrect, which I then looked back on my work, where I then found my mistakes and corrected them. After this fix, I got the correct answer.

6.2 Problem 11.

Outside temperature over the course of a day can be modeled as a sinusoidal function. Suppose you know the high temperature of 105 degrees occurs at 5 PM and the average temperature for the day is 85 degrees. Find the temperature, to the nearest degree, at 9 AM.

Answers:

75° F

Comments

While this problem was a bit of work, after doing the last problem I had got done the process and was able to complete the problem without all too many issues.
I checked my answer using the answer key, which showed my answer to be correct.

6.3 Problem 13.

Outside temperature over the course of a day can be modeled as a sinusoidal function. Suppose you know the temperature varies between 47 and 63 degrees during the day and the average daily temperature first occurs at 10 AM. How many hours after midnight does the temperature first reach 51 degrees?

Answers:

8 hours

Comments

Much like the last problem, after my previous work, I was able to solve the problem without all too many issues. While each problem became a little more complex, after working on similar problems, these new additions to the problem don't make it that much more difficult.
I checked my answer to be safe, which the answer key showed that my answer was correct.

6.4 Problem 15.

A Ferris wheel is 20 meters in diameter and boarded from a platform that is 2 meters above the ground. The six o'clock position on the Ferris wheel is level with the loading platform. The wheel completes 1 full revolution in 6 minutes. How many minutes of the ride are spent higher than 13 meters above the ground?

Answers:

2.8 minutes

Comments

Again, same story as the last problem. While it was a good bit of work, my previous work with the last few problems made it easier and I was able to complete the problem without too many issues.
Though after checking my answer I realized that I made a few math errors and fixed them. After correcting this, and resolving the problem, I got the correct answer.