

**Chapter 6, Section 1:** (Main idea: Inverse Trig Functions)

**Before you even approach this section,** remember that you already know how to use inverse trig functions on your calculator and how to solve trig functions using graphs. It is very important to review that here before starting this section. Look over your work on Chapter 2, Section 3, and on the supplement to Chapter 2, section 3. Pay careful attention to your methods of finding multiple solutions using the graphs.

In this section, we recall that functions which do not “pass” the horizontal line test do not have inverse functions. But then we also recall that sometimes we restrict the domain of the original function so that the modified function does pass the horizontal line test and so does have an inverse function. Trig functions are some of the most important examples using that technique.

The trigonometry in problem 96 is a fairly simple right-triangle problem. First, can you see from the diagram that the answer has to be a little less than 50%, if the diagram is reasonably accurate? Is the diagram reasonably accurate? (See if the length given as 20,000 is between twice and three times as long as the distance given as 7297.)

Start your solution by finding the radius of the Earth at the equator. So you can label three of the lines in the picture with that number. And notice that the satellite is 20,000 miles (use as three significant digits) above the surface of the earth at the equator. So you can add that and the radius to find the hypotenuse of the triangle. After you find the angle, there are still a few steps to do to answer the question. Can you see what those questions are? Ask in class for an outline of those steps if you can't figure them out.

6.1: # 13-26, 33-36, 41, 42, 47, 49, 51, 60-63, 65, 66, 67, 69, 70, 71,  
73, 74, 79, 81, 83, 86, 87, 96

**Chapter 6, Section 2:** (Main idea: Trig Equations)

In this section you must think of algebra and trigonometry together. Look at the examples in the text carefully to see that these are familiar algebra techniques for solving equations. Notice how to write those solutions as well, including collecting all of your solutions into one solution set at the end of the problem. These are very important problems in the course.

We have to use trig identities to rewrite expressions as necessary so that every equation that we are actually trying to find solutions for are equations with only one trig function. Notice that in Example 2, we still have two different trig functions, but then we separate them. This is important.

6.2: # 11, 13, 15, 17, 19, 21, 23, 25, 27, 31, 33, 35, 41-43, 47, 52, 53, 55

**Chapter 6, Section 3:** (Main idea: More Trig Equations)

This builds on the previous section. Just as in the previous section, we can rewrite the expression, as needed, so that each equation we're actually trying to solve includes only one trig function of one angle. (That is, if we have  $\sin(2x)$  and  $\sin(x)$ , that's not simple enough yet.)

And here we must also notice that  $\frac{\sin(2x)}{2} \neq \sin(x)$ . Remembering how to deal with these is an important part of learning the algebra of trigonometry.

Obviously you must use graphing technology to do problem 43a. For the rest of this problem, just describe what the graph shows that is relevant to the questions asked.

6.3: # 7, 9, 16, 19, 21, 23, 25, 27, 33, 43, 46

**Chapter 6, Section 4:** (Main idea: Trig Equations – Inverse Trig Functions)

The basic algebra here is summarized by: if  $y = \sin x$  then find the inverse function by solving

$$y = \sin x$$

for  $x$ . That is,  $\sin^{-1} y = \sin^{-1}(\sin x)$

$$\sin^{-1} y = x$$

Read the first two examples in the text and see how they use this idea. That's the main type of problem to learn in this section.

For the next type of problems, recall that several times in the course, starting in 1.4, we used the value for one trig function to find the other trig functions. Notice how that same idea is used in Example 3.

6.4: # 5, 7, 9, 11, 15, 17, 23, 25, 31, 33

**Chapter 6 Test:**

Remember that no calculator will be allowed on Test 3. Follow the same instructions as for the chapter tests.

Chapter 6 Test: Do all problems. On problems 7-11, if you can't solve the equation completely without a calculator, then go as far as you can without the calculator. After you finish all the Chapter Test, but before you check your solutions, get out your calculator and finish any of those that you need the calculator for. Then grade your test.

Extra work: As needed. You are not required to submit any extra work.

**Test 3 Review.**

Materials allowed for the test: graph paper, ruler, blank paper

**No notes and no calculator are allowed on Test 3. The formula sheet, with blanks, will be provided.**