Precalculus-04, Minitest 4 Review

Dr. Graham-Squire, Fall 2013

•The test will cover sections 5.5 and 6.1-6.4.

•To study, you can look over your notes, rework HW problems on WebAssign, quizzes, and problems from the notes, as well as work out the practice problems given for each section. The Review Questions at the end of Chapters 5 and 6 are also good practice. You can also look at the following problems on my website:

(i) Quiz 3, question 4

(ii) Test 1, questions 7 and 9 and the Extra credit

(iii) Test 2, questions 2 and 9

•Calculators <u>are</u> allowed on this test, but for certain questions you may not be allowed to use a calculator. For those without graphing calculators, there may be a section on the test where you can use either a calculator or a computer.

•You must know the unit circle! There will be questions on the test where you will not have a calculator and you will have to find certain trigonometric values.

•Some practice problems to work on:

1. Without a calculator, find the exact value of the following. If an expression does not exist, write DNE and explain why it does not exist.

    (a) $\sin^{-1}(-\frac{\sqrt{2}}{2})$

    (b) $\cos^{-1}(1)$

    (c) $\tan^{-1}(1)$

    (d) $\cos^{-1}(\frac{\pi}{2})$

    (e) $\tan^{-1}(-\sqrt{3})$

   (f) $\tan^{-1}(\tan\left(\frac{4\pi}{3}\right))$

    (g) $\tan(\sin^{-1}(1))$

2. Sketch a graph of the tangent function for x-values between $-\pi/2$ and $\pi/2$. Now draw the line $y = x$, and flip the graph of tangent over the line $y = x$ to sketch the graph of $y = \tan^{-1} x$

3. New York and Los Angeles are 2450 miles apart. Thinking of that distance as an arc lying on a circle, find the angle that the arc subtends at the center of the earth. (Note: you will need to use the fact that the radius of the earth is 3960 miles). Find the angle in both radians and degrees, round to the nearest 0.1.

4. Solve the right triangle with a hypotenuse of length 20 and one angle equal to 53°. Round to the nearest 0.1.

5. Solve for x. Round to the nearest 0.1.
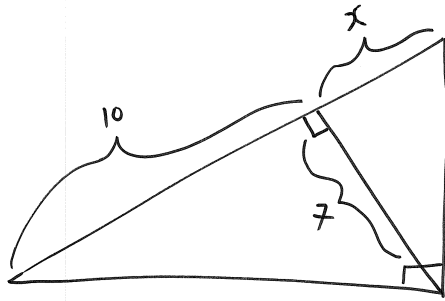
6. A plane is flying at an elevation of 5000 feet, directly above a straight highway. Two cars are on the highway on opposite sides of the plane. The angle of depression to one car is $35°$ and the angle of depression to the other car is $48°$. How far apart are the cars? Round to the nearest 0.1 feet.

7. Write $\sec\theta$ in terms of $\sin\theta$, assuming θ is in Quadrant 2.

8. Find the exact value of $\sin(\tan^{-1}\frac{11}{8})$, without using a calculator. Then write it as a decimal number and compare to what you get on a calculator.

9. A tower has a height of 1380 feet, and it is casting a shadow of length 2000 feet. What is the angle of elevation of the sun at that moment?