

Review for **MA 154 Test 1** - Friday, September 26, 2008  
Sections **6.1- 6.6** (and some of **6.7**) and **Chapter 6 Tools**

1. Determine the values of the period, amplitude and midline from a sinusoidal function. Use a graph of  $y = f(t)$  to find a given to find a value of  $y$  if given a value of  $t$  or vice versa. Interpret what these values mean in terms of the context of the problem. See Quiz 2 and Section **6.1** – 13-28, 32 and **Ch 6 Review** 19-21
2. Sketch the position of a point on a circle of radius  $r$  corresponding to a given angle (or value of time) and give its coordinates. See Quiz 2 and Section **6.2** – 1-25, 28, 32 and Section **6.3** – 37-38 and **Ch 6 Review** #2
3. If given a point on a circle as determined by an angle  $\theta$ , find coordinates corresponding to  $\theta + \pi$ ,  $\pi - \theta$ , etc. (or equivalent questions in terms of degrees). Interpret the sine or cosine of these angles as coordinates. See Quiz 3 and Section **6.2** - 29, 30 and Section **6.3** - #40
4. Determine in which quadrant an angle lies if given certain conditions. See **Ch 6 Review** - #3
5. Understand radian measure. Section **6.3** – 1-45 and **Ch 6 Review** – 4-14
6. Understand the relationship between arclength, radius and an angle measure in radians. If given two of the arclength, radius or an angle find the third. Note:  $s = r\theta$  = only if  $\theta$  is in radians. Section **6.3** – 20-34, 42, 43 and **Ch 6 Review** – 15-17, 54
7. Know exact values of sine and cosine for multiples of  $30^\circ$ ,  $45^\circ$ , and  $60^\circ$  and their radian equivalents. Section **6.4** -- 10-15, 23, 24 and **Ch 6 Review** 35-37, 48 and also Section **6.7** -- 7-14, 25, 26. Draw these angles on the unit circle.
8. If given two sides of a right triangle and an angle  $\theta$ , find the third side and find exact values of  $\sin \theta$ ,  $\cos \theta$ , and  $\tan \theta$ . See **Ch 6 Tools** – 1-20
9. Solve applied problems involving right triangles. See **Ch 6 Tools** – 21-23, 25, 28, 30, 31
10. Identify the period, amplitude, midline, and horizontal shift of a sinusoidal function given the equation or graph or verbal description. Section **6.4** #1-8, Section **6.5** # 1-4, 7, 9, 10 and **Ch 6 Review** #19-29
11. Know the main characteristics (period, amplitude, midline, domain, range, concavity, symmetry, when it is positive, negative, increasing, decreasing) of the graph of  $y = \sin \theta$ , and  $y = \cos \theta$ . Relate this to the unit circle as the  $x$ -coordinate (cosine) or the  $y$ -coordinate (sine) of the point on the circle. Section 6.3 – 26, 27 and Section **6.4** #9, 16-22, 26, 27 and Section **6.5** #25 and **Ch 6 Review** #3.
12. Understand the definitions of  $\sin \theta$ ,  $\cos \theta$ ,  $\tan \theta$ ,  $\csc \theta$ ,  $\sec \theta$ ,  $\cot \theta$  and be able to find **exact** values
  - a. if given the angle  $\theta$  as a multiple of  $30^\circ$ ,  $45^\circ$ , and  $60^\circ$ ; (or  $\pi/6$ ,  $\pi/4$ , or  $\pi/3$ )  
Section **6.4** #10-15, 23, 24 and Section **6.6** #1-16 and Section **6.7** #25, 26 and **Ch 6 Review** #35-37
  - b. if given the value of one of these trig functions and which quadrant the angle  $\theta$  is in. (Use  $\sin^2 \theta + \cos^2 \theta = 1$  or set up a right triangle with labeled sides and invoke the help of Pythagoras and SOHCAHTAH).  
Section **6.6** #17-20, 23, 24, 28-31 and **Ch 6 Review** #38  
Know that exact values are not decimal approximations read off of a calculator display.
13. Given the equation or graph or verbal description of a sinusoidal function, find a possible formula.  
Section **6.5** #11-18, 27-33, 35, 37-40, 42 and Section **6.7** #51, 53 and **Ch 6 Review** #30, 42-47, 60, 61, 64
14. Understand  $y = A\sin(B(x-h)) + k$  and  $y = A\cos(B(x-h)) + k$ . Know how  $A$ ,  $B$ ,  $h$ ,  $k$  affects the shape of the graph, their relationship to the amplitude, period, and horizontal and vertical shifts, and their practical significance in a problem situation. Section **6.5** #19-22, 26, 41 and **Ch 6 Review** #18, 30, 31-34, 64
15. Understand the main characteristics (period, domain, range, concavity, symmetry, when it is positive, negative, increasing, decreasing, vertical asymptotes, behavior near its vertical asymptotes) of the graph of  $y = \tan \theta$ . Relate this to the unit circle as the slope of the line through the origin which is the terminal side of the angle  $\theta$ . Section **6.6** #26-34 and **Ch 6 Review** #3
16. Understand the behavior of reciprocal functions and how the graph of any function  $y = f(x)$  and the graph of its reciprocal  $y = 1/f(x)$  are related. See Section **9.5** # 19-20 and Section **6.6** # 38