AP Calculus AB Summer Assignment

For best results, complete these assignments *in the week or two before returning to school.* That way the material will be as fresh as possible when school begins in the fall.

The intent of these assignments is to help you brush up/maintain your Algebra and Pre-Calculus skills so you will be ready to jump in to Calculus material in the fall. This assignment (done on separate paper with all necessary work shown) is **due on the first day of class.** We will go over the material briefly and have a test the first week of school. In addition to this packet of work, you are expected to see Mr. Denny to check out a textbook over the summer and complete the assignments listed below.

The book can also be accessed with the following link:
https://drive.google.com/a/lexington1.net/file/d/0B16ZdIzC_F1cYThXREdjdFVsNTQ/view?usp=sharing

I am looking forward to working with you next year. Have a great summer and come back ready to work! You may email me at rhill@lexington1.net if you have questions.

Assignments from textbook:

Label each assignment with the assignment number and the page number. Show all of your work. While it will be of no benefit to you to simply copy the answers…you can go to www.calcchat.com, choose your textbook and see all odd problems completely worked out.

Assignment 1: p. 8-9: 19-25 odd, 29-39 odd, 63, 67, 69

Assignment 2: p. 16-17: 22, 25, 29-33 odd, 37-43 odd, 47, 63, 67

Assignment 3: p. 27-30: 1, 7, 9, 21, 25, 3, 35, 43, 45, 47, 61, 69, 79, 80, 97

Assignment 4: Complete the rest of this packet.

A. Finding x- and y-intercepts
   1. $y = \frac{1}{4}x + 6$
   2. $y = x^2 + 6x - 8$
   3. $4x^2 - 5y^2 = 10$

B. Determine symmetry of an equation:
   If symmetric to the x-axis, changing each y to a (-y) will not affect the equation.
   If symmetric to the y-axis, changing each x to a (-x) will not affect the equation.
   If a function is symmetric to the origin, then f(-x) will equal –f(x).
   4. Determine the symmetry for each equation:
      a. $y = 5x^2 - 6$
      b. $f(x) = 8x^3 - 5x$
      c. $x^2 + y^2 = 5$

C. Even/Odd Functions
   5. What makes a function odd? What will it be symmetric to?
   6. What makes a function even? What will it be symmetric to?

D. Solve systems of Equations:

7. $\begin{cases} x = y^2 + 3 \\ y = x - 5 \end{cases}$

8. $\begin{cases} x^2 + y^2 + 25 \\ 2x - 3y = -6 \end{cases}$

E. Write an equation of the line going through the point (3, -2) and

9. with a slope of – ¼
10. through the point (-4, 2)
11. and perpendicular to the line $2x - 5y = 3$
12. and parallel to the y-axis

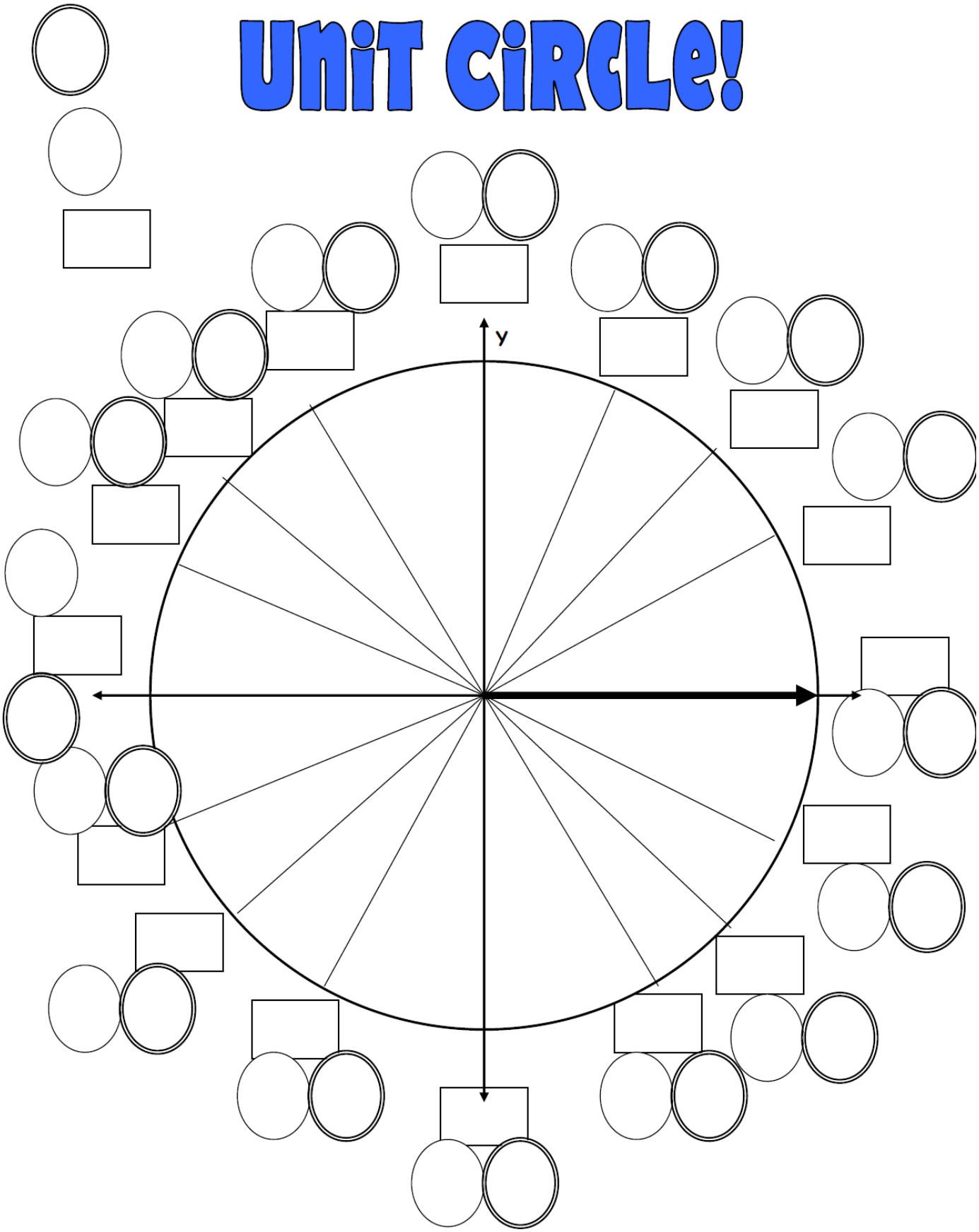
F. Determine if an equation is a function:

13. $x^2 - y = 18$
14. $x + y^2 = 10$

G. Work with functions. If $f(x) = x^3$ and $g(x) = x - 3$,

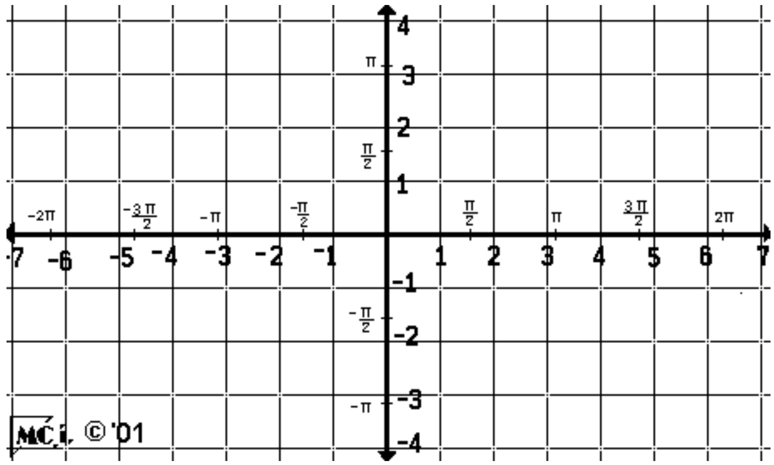
15. Find $f(g(x))$
16. Find $\frac{f(x+b)-f(x)}{b}$

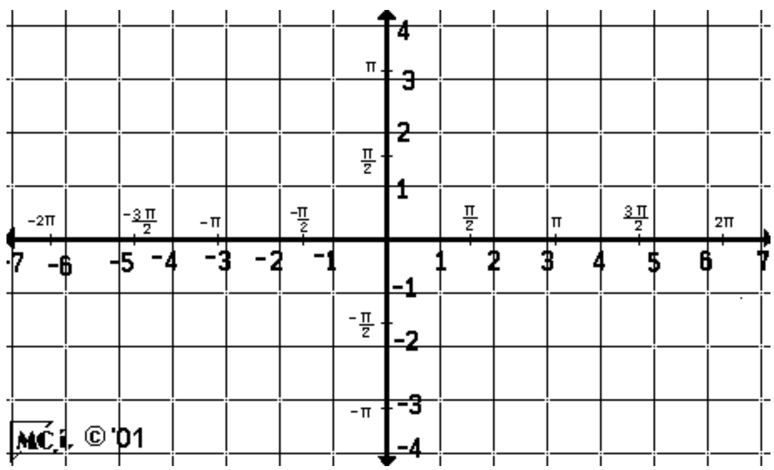
Complete the following Unit Circle. Put ordered pairs in the rectangles, degrees in the single ovals, and radians in the double ovals.

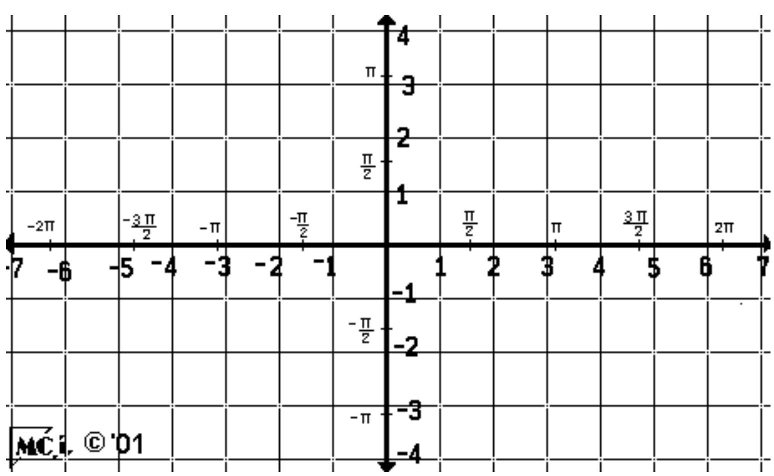


Draw the graphs of y = sinθ, y = cosθ, and y = tanθ.

Trig Graphs







Special Angles

Find each exact value. Do NOT use a calculator.

1. $cos60°$

2. $sin\frac{\pi}{3}$

3. $csc90°$

4. $tan\frac{9\pi}{3}$

5. $sec\frac{7\pi}{3}$

6. $cot45°$

7. $sec270°$

8. $cos\frac{5\pi}{6}$

9. $sin\frac{7\pi}{6}$

10. $csc\left(-\frac{7\pi}{2}\right)$

11. $tan3\pi$

12. $cot\frac{19\pi}{3}$

Memorize these and Know them Well!!

Definition of the Six Trigonometric Functions

Right triangle definitions, where $0 < \theta < \frac{\pi}{2}$ (see Figure C.30).

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}} \qquad \cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}} \qquad \tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$\csc\theta = \frac{\text{hypotenuse}}{\text{opposite}} \qquad \sec\theta = \frac{\text{hypotenuse}}{\text{adjacent}} \qquad \cot\theta = \frac{\text{adjacent}}{\text{opposite}}$$

Trigonometric Identities

[*Note that* $\sin^2\theta$ *is used to represent* $(\sin\theta)^2$.]

Pythagorean Identities:

$$\sin^2\theta + \cos^2\theta = 1$$
$$1 + \tan^2\theta = \sec^2\theta$$
$$1 + \cot^2\theta = \csc^2\theta$$

Double–Angle Formulas:

$$\sin 2\theta = 2\sin\theta\cos\theta$$

$$\cos 2\theta = 2\cos^2\theta - 1 = 1 - 2\sin^2\theta = \cos^2\theta - \sin^2\theta$$

Reciprocal Identities:

$$\csc\theta = \frac{1}{\sin\theta}$$
$$\sec\theta = \frac{1}{\cos\theta}$$
$$\cot\theta = \frac{1}{\tan\theta}$$

Quotient Identities:

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$
$$\cot\theta = \frac{\cos\theta}{\sin\theta}$$