Name: _____   PID: _____

> NOTE: You must show the steps necessary to arrive at your answer unless otherwise noted. Use your judgment, if you can't do the entire problem in your head, then you probably should write down at least some intermediate steps.
>
> This assignment has 9 pages. There are 42 total points.

Problem 1 (4 points). Let $g(a) = \log_2(3 - a)$.

(a) Find a formula for $g^{-1}(a)$.

(b) What is the domain and range of $g^{-1}(a)$? Write your answers in inequality or interval notation.

Problem 2 (4 points). Let $h(y) = 5 \cdot 4^{y+2} - 1$.

(a) Find a formula for $h^{-1}(y)$.

(b) What is the domain and range of $h^{-1}(y)$? Write your answers in inequality or interval notation.

Problem 3 (1 point). Suppose $b(u)$ has a single horizontal intercept at $(-\frac{1}{2}, 0)$. If $c(u)$ is the inverse of $b(u)$ (that is, $c(u) = b^{-1}(u)$), where is the vertical intercept of $c(u)$?

Problem 4 (4 points). Let $r(t) = 6^t$. Describe the following functions in terms of transformations of $r(t)$ (for instance, "the function $w(t)$ is $r(t)$ reflected horizontally," or " $w(t)$ is $r(t)$ stretched vertically by a factor of 2.").
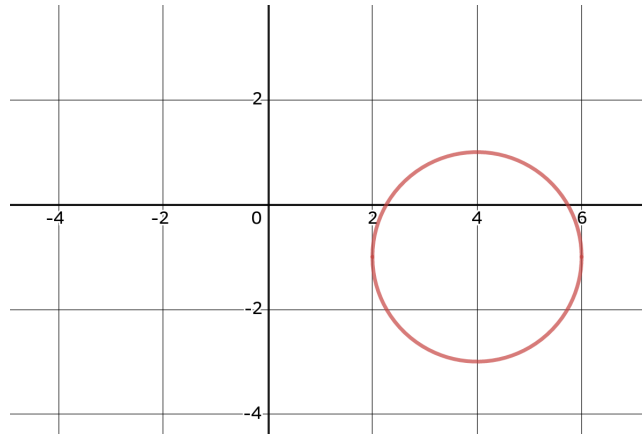
(a) $p(t) = 6^t - 4$

(b) $q(t) = 6^{t+2}$

(c) $k(t) = 6^{-t}$

(d) $l(t) = -6^t$

**Problem 5** (2 points). Determine the equation of the following graph.

Problem 6 (2 points). What is the equation of the circle that is centered at the point $(-2, -\frac{4}{3})$ and has radius $\frac{1}{2}$?

Problem 7 (2 points). Sketch the circle defined by the equation $(x+4)^2+(y+2)^2 = 16$. Make sure your axes have descriptive tick marks so that the center and radius are clear.

Problem 8 (4 points). Where does the line $f(x) = x - 2$ intersect the circle from Problem 7? Solve for these points algebraically and show your work.

Problem 9 (4 points). Estimate the measure of the following angles. Possible answers are 30, 120, 150, and 300 degrees.
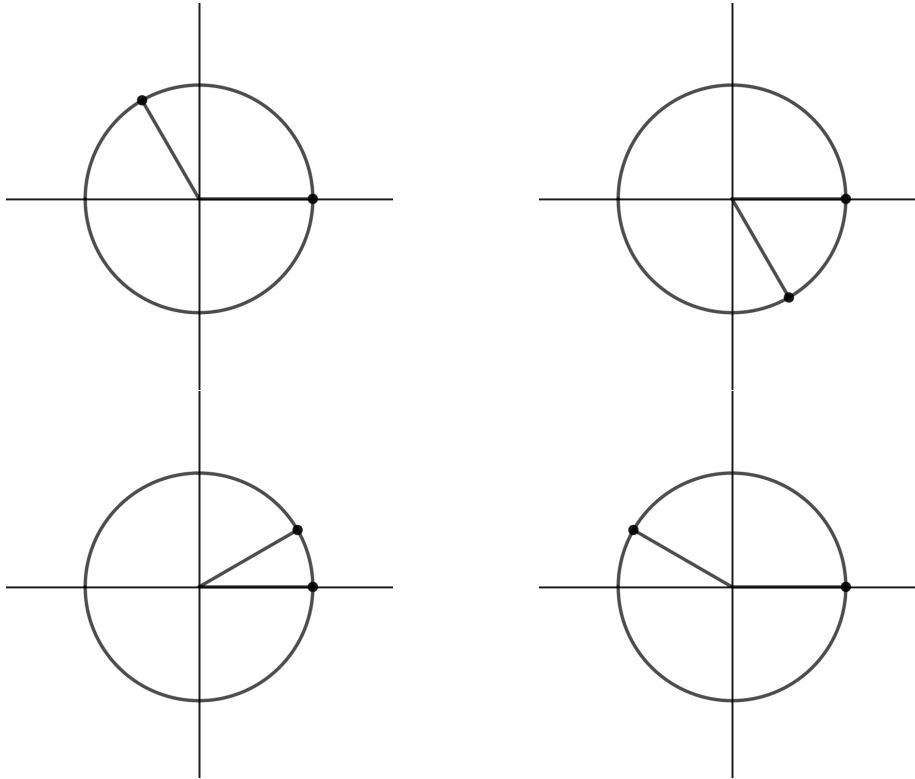
Problem 10 (3 points). Convert the following angle measures into radians. Show your work.

(a) 45°

(b) 240°

(c) −60°

Problem 11 (4 points). Convert the following angle measures from radians into degrees. Show your work.

(a) 2π

(b) $\frac{\pi}{2}$

(c) $\frac{5\pi}{6}$

(d) $\frac{11\pi}{6}$

Problem 12 (4 points). Determine if the following angles are coterminal. Show your work.
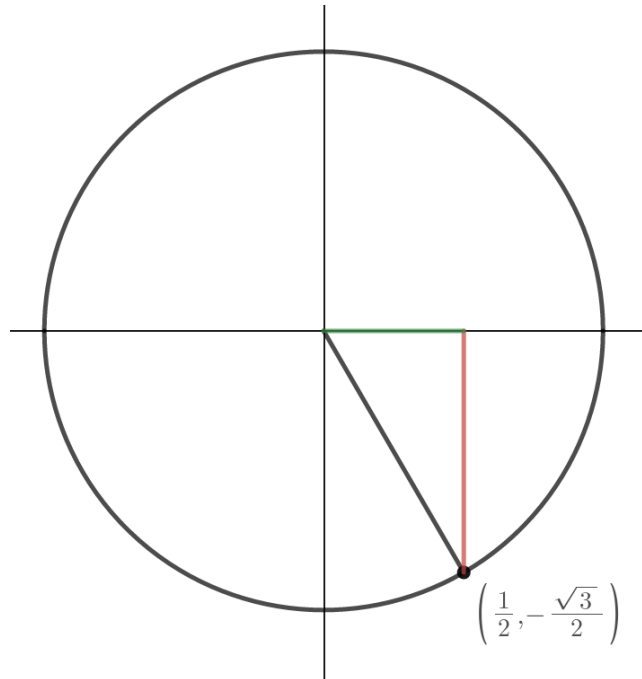
(a) $-200°$ and $160°$

(b) $30°$ and $-30°$

(c) $\frac{2\pi}{5}$ and $\frac{7\pi}{5}$

(d) $810°$ and $\frac{\pi}{2}$

Problem 13 (2 points). The point $(5, 12)$ lies on a circle of radius 13 centered at the origin at an angle θ. Determine the values of $\sin(\theta)$ and $\cos(\theta)$. *Note: you do not need to know what θ is in this problem*

Problem 14 (2 points). Let θ be the angle that determines the point in the circle below. Find the values for $\sin(\theta)$ and $\cos(\theta)$.

$$\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$

[OPTIONAL]
Survey Questions.
1. The content in lectures matches well with the content in homework.

    Strongly Agree   **Agree**   **Neither Agree nor Disagree**   **Disagree**   **Strongly Disagree**

2. The content in lectures matches well with the content in quizzes.

    Strongly Agree   **Agree**   **Neither Agree nor Disagree**   **Disagree**   **Strongly Disagree**