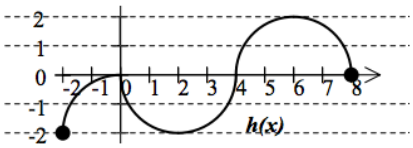
ACMAT161 Summer 2024
Professor Manguba-Glover
Homework 1 Name: _____

Show all work and simplify all answers before circling/boxing them. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

**Due next class.** Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

1. Find the domain of $y = \frac{1}{3x+12}$ in interval notation
2. Find the domain of $y = \sqrt{3x+12}$ in interval notation
3. Consider the following graph




   (a) What is the domain and range?
   (b) What is $h(4)$, $h(-2)$, and $h(6)$?
   (c) For what $x$ value(s) does $h(x) = 0$?

4. Let $f(x) = \begin{cases} \pi x^2 & , x < 2 \\ 1 + x & , 2 \le x \le 2.5 \\ 4x & , x > 2.5 \end{cases}$

   Find $f(1)$, $f(2)$, and $f(3)$.

5. Graph

$$f(x) = \begin{cases} 1 & x < 0 \\ -1 & x = 0 \\ 2 & x > 0 \end{cases}$$

6. Find $g \circ f$ and $f \circ g$ for $f(x) = \frac{x-3}{2}$, $g(x) = \sqrt{x}$
7. Write the following as a composition of functions $f \circ g$:

   (a) $(x+2)^5$
   (b) $\cos^2(x)$
   (c) $\sqrt{\sin x}$

8. Find an equation of the line with the given properties: Slope $= -5$ and $(-2, 1)$ is on the line
9. Find an equation of the line with the given properties: Slope $= \frac{1}{3}$ and $\left(-6, \frac{2}{3}\right)$ is on the line
10. If $f(x) = 2x^2 - 5x + 1$ and $h \neq 0$, evaluate $\frac{f(x+h)-f(x)}{h}$