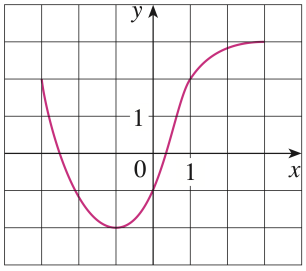
ACMAT161 Summer 2024
Professor Manguba-Glover
Classwork 1 & 2 Name: _____

Complete as many of the following problems as you can with your table in the allotted time. You do not have to go in order.

Classwork 1

1. The graph of a function f is given below. Use it to answer the following questions:



   (a) What is $f(-1)$?
   (b) For what values of x is $f(x) = 2$?
   (c) State the domain and range of f.

2. If $f(x) = x^3$, evaluate $\frac{f(2+h)-f(2)}{h}$

3. Find the domain of $f(x) = \frac{2x+1}{x^2+x-2}$

4. If $f(x) = x^2 + 2x - 1$ and $g(x) = 2x - 3$, find the following:

   (a) $f \circ g$ (b) $g \circ f$

5. Find an equation for the line that passes through the point $(2, -5)$ and:

   (a) Has slope -3
   (b) is parallel to the x-axis
   (c) is parallel to the y-axis
   (d) is parallel to the line $2x - 4y = 3$

6. Let $f(x) = \begin{cases} 1 - x^2 & \text{if } x \le 0 \\ 2x + 1 & \text{if } x > 0 \end{cases}$

   (a) Evaluate $f(-2)$ and $f(1)$ (b) Sketch the graph of f

Key:

1. (a) -2
   (b) $-3, 1$
   (c) $[-3, 3]$, $[-2, 3]$
2. $12 + 6h + h^2$
3. $(-\infty, -2) \cup (-2, 1) \cup (1, \infty)$
4. (a) $4x^2 - 8x + 2$
   (b) $2x^2 + 4x - 5$
5. (a) $y = -3x + 1$
   (b) $y = -5$
   (c) $x = 2$
   (d) $y = \frac{1}{2}x - 6$
6. (a) -3, 3
   (b) Use technology to check

Classwork 2

1. Simplify $(3a^3b^3)(4ab^2)^2$
2. Simplify $\left(\dfrac{3x^{3/2}y^3}{x^2y^{-1/2}}\right)^{-2}$
3. Solve $e^{5-3x} = 10$
4. Solve $-6\log_3(x-3) = -24$
5. Expand: $\log_5\left(\frac{\sqrt{x}}{25y^5}\right)$
6. Combine into one logarithm: $5\ln c - \ln k + 4\ln y$
7. Find $\tan\left(\frac{\pi}{3}\right)$, $\sin\left(\frac{7\pi}{6}\right)$, and $\sec\left(\frac{5\pi}{3}\right)$
8. Solve $2\sin^2\theta + 5\sin\theta = 3$
9. Evaluate $\sin^{-1}\left(\frac{1}{2}\right)$
10. Evaluate $\tan\left(\arcsin\frac{1}{3}\right)$

Key:

1. $48a^5b^7$
2. $\frac{x}{9y^7}$
3. $\frac{1}{3}(5-\ln 10)$
4. 84
5. $\frac{1}{2}\log_5 x - 2 - 5\log_5 y$
6. $\ln\left(\frac{c^5y^4}{k}\right)$
7. $\sqrt{3}$, $-\frac{1}{2}$, and 2
8. $x = \frac{\pi}{6} + 2\pi n, \frac{5\pi}{6} + 2\pi n$
9. $\frac{\pi}{6}$
10. $\frac{1}{2\sqrt{2}}$