Instructions. Please work on the following problems in groups, while the TAs circulate. While you will not need to submit your answers, make sure to show your progress to the TAs on every problem.

1. Find the domain of each of the following functions:
   (a) \( f(x) = \sqrt{x - 2} \)
   (b) \( g(x) = \sqrt{7 - x} \)
   (c) \( h(x) = \sqrt{x - 2} + \sqrt{7 - x} \)
   (d) \( j(x) = \sqrt{x^2 - 9} \)
   (e) \( r(x) = \frac{1}{x + 5} + \sqrt{x^2 - 9} \)

2. Identify the following angles on the unit circle:
   \( \frac{\pi}{3}, \frac{7\pi}{4}, \frac{5\pi}{2}, \frac{8\pi}{3}, -\frac{\pi}{4} \)

3. For each of the angles in question (2) above, find sine and cosine of that angle. So, find \( \sin(\pi/3), \cos(\pi/3), \sin(7\pi/4), \) etc.

4. Show that the following identity holds:
   \[ \cos^2(\theta) + \sin^2(\theta) = 1 \]
   for any given angle \( \theta \). Recall that \( \cos^2(\theta) \) means \((\cos(\theta))^2\).

5. Let \( f(x) = \frac{x + 1}{x + 2} \). Find \( f(f(x)) \). Simplify your answer as much as possible. The final answer should be expressed as a single fraction.

6. Let’s review the exponent rules. Simplify the following expressions:
   (a) \( x^5 \cdot x^6 \)
   (b) \( (x^3)^2 \)
   (c) \( (x^2)^3 \)

7. Justify the following identity:
   \( (xy)^3 = x^3y^3 \)
   Now do the same for \( (xy)^n = x^ny^n \) where \( n \) is any positive integer \( n \).