PROBLEM SET 1B

1. $15^{2x+1} = 17^{x+1}$

2. Find all values of x in the interval $[0, 2\pi]$ which satisfy the inequality. Write your solution as a union of intervals.

$$\sin x \leq 0.5$$

3. Find the domain of the function. Express your answer in interval notation.

$$f(x) = \ln\left(x - \frac{x^2 - 21}{x + 7}\right)$$

4. Sketch the graph (include 2 full periods) of the function. Find the exact value of all x-intercepts.

$$y = 2\cos(\pi x - \frac{\pi}{4})$$

5. Find the domain of the function.

$$f(x) = \frac{2x^2 + 5x - 3}{2x^2 - 5x - 3}$$

6. Find the exact values of all solutions x in the interval $[0, 2\pi)$ to the equation.

$$\sec^2 x - 6\tan x + 4 = 0$$

7. Find the domain and range of the function, and sketch it. Indicate the x and y-intercepts on the graph.

$$f(x) = \sqrt{x+4}$$

ANSWERS.

1. $\frac{\ln 17 - \ln 15}{2 \ln 15 - \ln 17}$
2. $[0, \frac{\pi}{6}] \cup [\frac{5\pi}{6}, 2\pi]$
3. $(-\infty, -7) \cup (-3, \infty)$
4. $n - \frac{1}{4}$ for integers n.
5. $(\infty, -\frac{1}{2}) \cup (\frac{1}{2}, 3) \cup (3, \infty)$
6. $\frac{\pi}{4}$, $\frac{5\pi}{4}$
7. domain: $[-4, \infty)$, range: $[0, \infty)$, intercepts: $(0, 2)$, $(-4, 0)$