

**Math 115, Section 068 - Quiz 2**  
**Date: 9/28/18**

**Name:** \_\_\_\_\_

Write legibly, show work and indicate your final answers. No books, notes, etc. are permitted. Calculators are permitted. This is double sided. Good luck!

1. (10 *points*) Find all solutions to

$$4 - 5 \sin\left(\frac{\pi}{2}x - \frac{\pi}{6}\right) = 2 \quad \text{for } 0 \leq x \leq 5$$

Your answers must be found algebraically and in **exact** form

Answer:  $x =$  \_\_\_\_\_

2. (10 *points*) Consider the rational function  $r$  defined by:

$$r(x) = \frac{3(x - \sqrt{2})(\pi x + 7)^2(x + 1)}{(x + 1)(x - \sqrt{3})}$$

For all of the following parts of this problem, leave your answers in exact form.

- (a) (2 points) What is the domain of  $r(x)$ ?

Answer: \_\_\_\_\_

- (b) (2 points) Find the equations of all vertical asymptotes of  $r(x)$ . If there are none, write *NONE*.

Answer: \_\_\_\_\_

- (c) (2 points) Let  $p(x) = 3x^2 + 1.2x - 5$ . Find the equations of all horizontal asymptotes of  $\frac{r(x)}{p(x)}$ . If there are none, write *NONE*. Show your work or reasoning to justify your answer.

Answer: \_\_\_\_\_

- (d) (3 points) If  $q(x) = \frac{2e^{kx}}{1+2^x}$ , find all values of  $k$  so that  $\lim_{x \rightarrow \infty} q(x) = 0$ . If there are none, write *NONE*. Show your work or reasoning to justify your answer.

Answer: \_\_\_\_\_