9. [9 points] Consider the rational function r defined by

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

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 $\dfrac{r(x)}{p(x)}$. If there are none, write NONE. Show your work or reasoning to justify your answer.

Answer: _____

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

Answer: _____