2. [11 points]

a. [2 points] Let $f(x) = \dfrac{3x^2}{10x^2 + x + 1} + 5$. Find the equation of the horizontal asymptote of the graph of $f(x)$. If the graph has no horizontal asymptote, write "None".

Horizontal asymptote: _____.

b. [2 points] For which of the following values of x is the function $f(x) = \sin(x)$ invertible? Circle all that apply.

$\dfrac{\pi}{2} \leq x \leq \dfrac{3\pi}{2}$ $\quad 0 \leq x \leq \pi$ $\quad -\dfrac{\pi}{2} \leq x \leq \dfrac{\pi}{2}$ $\quad 0 \leq x \leq 2\pi$ $\quad$ None of these.

c. [3 points] Find the equations of the vertical asymptotes and the x coordinate(s) of the hole(s) of the function $f(x) = \dfrac{(x-2)(x-3)}{2x^2 - 5x + 2}$.

Write "None" if the graph of this function does not have a hole or a vertical asymptote. Show all your work.

Vertical asymptotes: _____ Holes: _____.

d. [4 points] Fill in the blanks:

i) Let $r(x) = (x^4 - 5)^4$. If with $r(x) = H(G(x))$ with $H(x) = x^4$, then

$G(x) =$_____

ii) Let $k(x) = 2e^{2x+1}$. If $k(x) = F(2x)$ then $F(x) =$_____.