Precalculus Unit 3: 3.2 Homework
Rational Function Graphs

For each of the following rational functions, find the domain, the vertical asymptote(s) / hole(s), the horizontal asymptote / slant asymptote, the x-intercept(s), the y-intercept, and draw a sketch. Provide work to support your answer.

1. \( f(x) = \frac{2x+5}{x+1} \)

   Domain: x-int:
   
   VA:
   
   Hole:
   
   HA / SA: y-int:

2. \( f(x) = \frac{2x}{x^2+x-2} \)

   Domain: x-int:
   
   VA:
   
   Hole:
   
   HA / SA: y-int:
3. \( f(x) = \frac{x^2 + 3x}{x^2 + x - 6} \)

Domain: x-int:

VA:

Hole: y-int:

HA / SA:

4. \( f(x) = \frac{2x^2 - 5x + 5}{x - 2} \)

Domain: x-int:

VA:

Hole: y-int:

HA / SA:
5. The concentration $C$ of a chemical in the bloodstream $t$ hours after injection into muscle tissue is given by $C = \frac{3t^2 + t}{t^3 + 50}$, $t \geq 0$.

a.) Determine the horizontal asymptote and interpret its meaning in the context of the problem.

b.) Graph the function on a graphing utility and approximate the time when the concentration is the greatest.

c.) Use the graphing utility to determine when the concentration is less than 0.345.