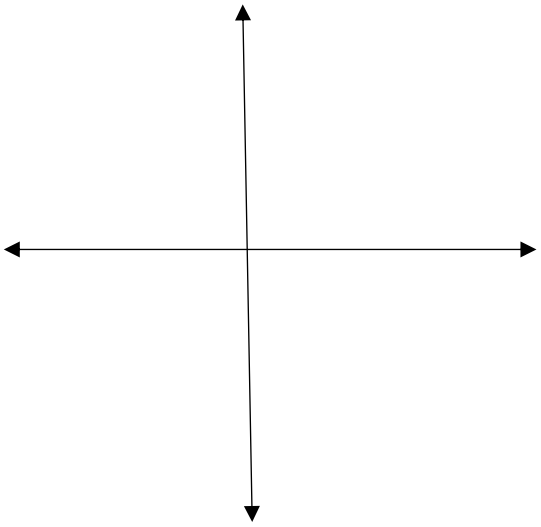
Exam 21 Name: _____ RHS
Pre-Calc RH

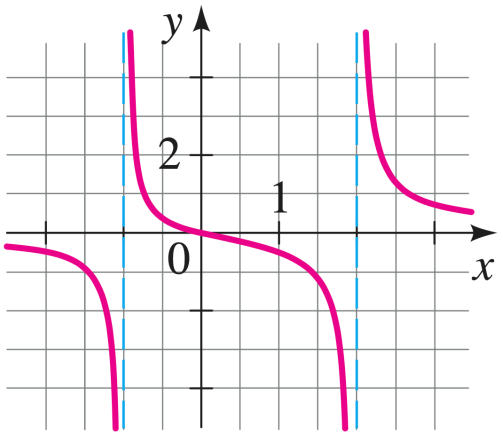
Show your work for full credits.

1. $f(x) = \frac{ax-4}{bx+6}$ has vertical asymptote at $x = -2$ and horizontal asymptote at $y = \frac{3}{2}$. Then, find the value of $a + b$.

2. Let $y = \frac{2x^2-7x+9}{2x-3}$
   a. State any asymptotes.
   b. Find x and y intercepts.
   c. Sketch the given function.



3. From the given graph below,
    a. Find asymptotes.
    b. Find x and y-intercepts
    c. Write an equation for the function below.



4. Let $P(x)$ be a polynomial which when divided by $x - 20$ has the remainder 19, and when divided by $x - 19$ has the remainder 20. What is the remainder when $P(x)$ is divided by $(x - 19)(x - 20)$?

5. Suppose that $P(2x) = x^2 + 3x - 1$. What is the product of all values of x for which $P\left(\frac{x}{4}\right) = 5$?

6. Divide, using synthetic division. Then, express the given fraction by quotient and remainder.

$a.\ \dfrac{3x^3 + x^2 - 10x + 5}{(x-1)(x+2)}$

$b.\ \dfrac{6x^2 - x - 6}{2x - 1}$

7. Evaluate

$a.\ \arccos\left(\cos\dfrac{4\pi}{3}\right)$

$b.\ \arctan\left(\tan\dfrac{11\pi}{6}\right)$

8. Let $h(x) = f\big(g(x)\big) = \sqrt{2x-1}$. If $f(x) = (x-3)^2 + 2$, find $g(x)$.

9. Let $f(x) = x + \sqrt{x-3}$ and $g\big(f(x)\big) = x$. Find the solution for
$f(x) = g(x)$