COLLEGE ALGEBRA

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GPS # 38 **4.5 RATIONAL FUNCTIONS AND RATIONAL EQUATIONS II** Class Time: 11:30 Date: 4-08-08

Useful Guidelines:

To analyze the graph of a rational function, $R(x) = \frac{p(x)}{q(x)}$, in lowest terms:

* Step 1: Find the domain of the rational function.
* Step 2: Find the x-intercept(s), if any (let $p(x) = 0$ when $R(x)$ is in lowest term), and the y-intercept(s), $R(0)$.
* Step 3: Write R in lowest term and find the real zeros of the denominator (vertical asymptotes).
* Step 4: Find the horizontal or slant asymptotes, if any.
* Step 5: Find the intervals on which R is above the x-axis and the intervals on which R is below the x-axis. [Hint: pick a point between the zeros obtained from both the numerator and the denominator.]
* Step 6: Graph the asymptotes, if any, plot the points, connect the points and graph R.

Analyze the graph of each function by following Step 1 through 6 above.

1) $R(x) = \frac{2x-10}{x}$

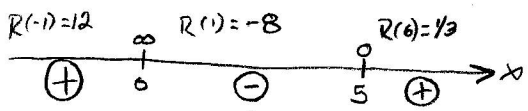
① D: $\{x/x \neq 0\}$ or $(-\infty, 0) \cup (0, \infty)$

② x-int: $(5,0)$ y-int: none

③ already in lowest term

④ V.A. $x=0$ H.A. $y=2$ S.A. none

⑤ $R(-1)=12$ $R(1)=-8$ $R(6)=1/3$



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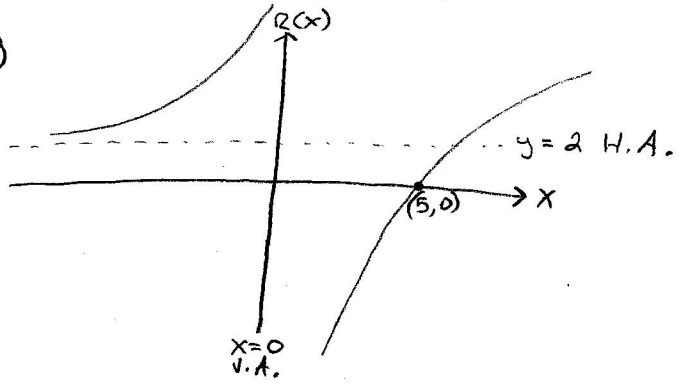


2) $R(x) = \frac{x^2-25}{x-5}$

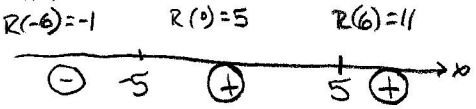
① D: $\{x/x \neq 5\}$ or $(-\infty, 5) \cup (5, \infty)$

② x-int $(-5,0)$ y-int $(0,5)$

③ $\frac{(x-5)(x+5)}{x-5} = x+5$

④ H.A. none V.A. none

⑤ $R(-6)=-1$ $R(0)=5$ $R(6)=11$



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