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no mb!

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 .

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

$$R(x) = \frac{24}{x^2 - 4}$$

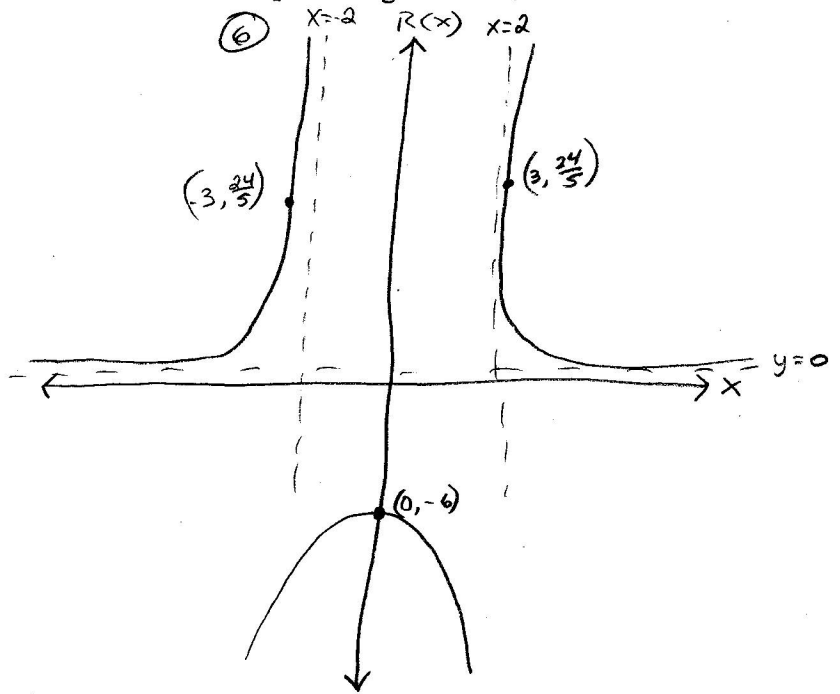
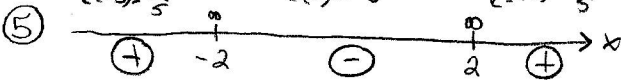
① D: $\{x \mid x \neq \pm 2\}$

② X-int: none
 y-int: $(0, -6)$

③ V.A. $x = \pm 2$
 $R(x) = \frac{24}{(x+2)(x-2)}$ is already in the lowest term

④ H.A. $y = 0$
 S.A. none

$R(-3) = \frac{24}{5}$ $R(0) = -6$ $R(3) = \frac{24}{5}$



2. Solve the rational equation and give the solution set.

a) $\frac{x}{x-5} + 1 = -3$

$$x \cdot 5 \left(\frac{x}{x-5} \right) = (-4) x - 5$$

$$x = -4x + 20$$

$$5x = 20$$

$$x = 4$$

$\left\{ x \mid x = 4 \right\}$

b) $\frac{16}{x^2 - 4} = 2$

$$\frac{16}{(x-2)(x+2)} = 2(x-2)(x+2)$$

$$16 = 2x^2 - 8$$

$$\frac{24}{2} = \frac{2x^2}{2}$$

$$12 = x^2$$

$$\pm \sqrt{12} = x$$

$$\pm 2\sqrt{3} = x$$

$\left\{ x \mid x = \pm 2\sqrt{3} \right\}$