Name _____

4-2 Reteach to Build Understanding

Graphing Rational Functions

The horizontal asymptote is determined by looking at the degrees of the numerator n and denominator m.

If $n < m$, then $y = 0$.

If $n = m$, then $y = \frac{a_n}{b_m}$, where a_n is the leading coefficient of the numerator and b_m is the leading coefficient of the denominator.

If $n > m$, there is no horizontal asymptote.

To find the vertical asymptote, set the denominator equal to 0 and solve for x.

1. Circle the horizontal asymptote of the graph of the function $f(x) = \frac{5x + 5}{x + 2}$.

Use $y = \frac{a_n}{b_m}$, where $a_n = 5$ and $b_m = 1$.

a. $-\frac{5}{1} = -5$ **b.** $\frac{-2}{1} = -2$ **c.** $\frac{2}{1} = 2$ **d.** $\frac{5}{1} = 5$

2. Circle the correct vertical asymptote of the graph of the function $f(x) = \frac{3x + 6}{x + 4}$.

If $x + 4 = 0$, then $x = ?$

a. -4 **b.** -3 **c.** 3 **d.** 4

3. A student described the asymptotes of the graph of the function $y = \frac{9x + 6}{3x + 3}$. The student states there were no horizontal asymptotes and the vertical asymptote is $x = 0$. Find the student's error(s) and fix them.

4. Use the function $f(x) = \frac{2x + 8}{2x + 2}$.

a. What is the horizontal asymptote(s) of the graph of the function?

$y = \frac{a_n}{b_m}$ where $a_n = 2$ and $b_m =$ _____, so then $y =$ _____

b. What is the vertical asymptote(s) of the graph of the function?

$2x + 2 = 0$, so then $x =$ _____