2 TRUTHS AND A LIE A

$f(x) = \dfrac{3x^2 - 9x + 7}{2x - 4x^2}$	$g(x) = \dfrac{9x^3 - 2x + 3}{x + 2}$	$h(x) = \dfrac{x^4(x-3)}{(x+2)(x-5)}$

STATEMENTS

1. $f(x)$ has a slant asymptote.
2. $\lim\limits_{x\to\infty} g(x) = \infty$
3. $h(x)$ does not have a horizontal asymptote.

WHICH STATEMENT IS THE LIE? EXPLAIN.

2 TRUTHS AND A LIE B

$f(x) = \frac{x^4 + 3}{x}$	$g(x) = \frac{9 - x^2}{x^4}$	$h(x) = \frac{5x^2 - 3x + 2}{x + 7}$	$j(x) = \frac{(x-2)(x+2)}{(2x-1)(2x+1)}$

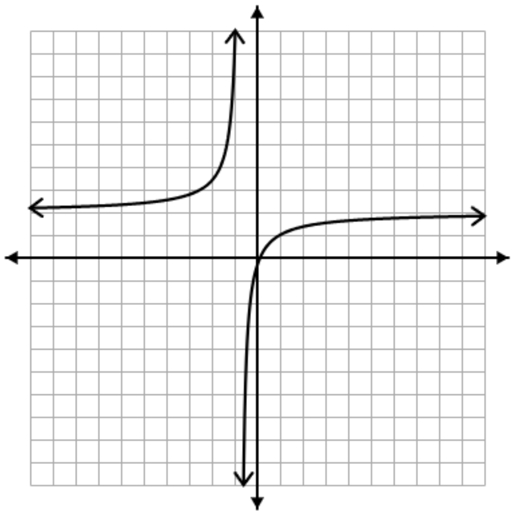
STATEMENTS

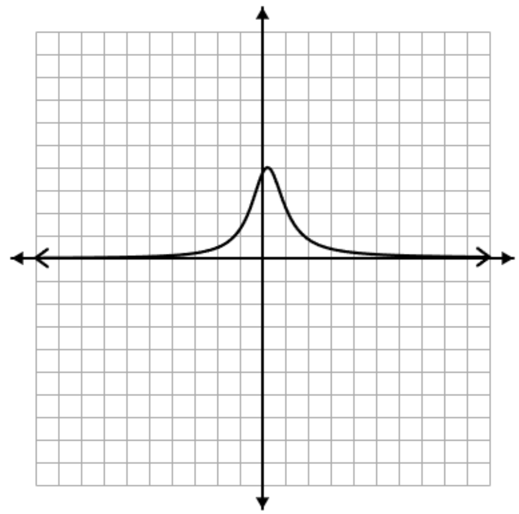
1. Two of the functions above have a horizontal asymptote.
2. Two of the functions above have a slant asymptote.
3. Two of the functions above have identical left and right end behavior.

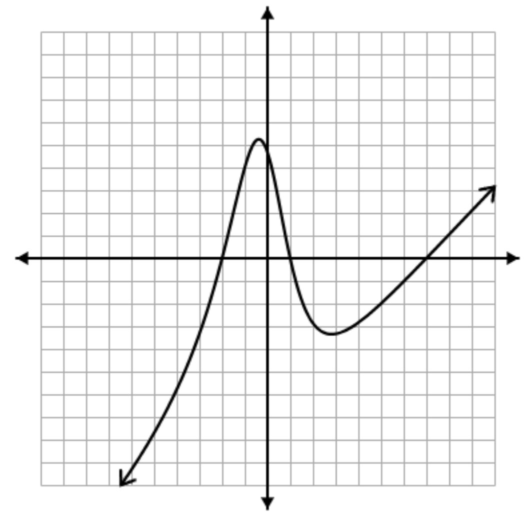
WHICH STATEMENT IS THE LIE? EXPLAIN.

MATCHING GRAPHS & EQUATIONS

CONNECT THE GRAPH OF EACH RATIONAL FUNCTION TO ITS EQUATION.







$$f(x) = \frac{x + 15}{5x^2 - 2x + 4}$$

$$g(x) = \frac{8x - 1}{4x + 3}$$

$$h(x) = \frac{(x - 1)(x + 2)(x - 7)}{x^2 + 3}$$

CREATE A RATIONAL FUNCTION

$\lim_{x \to \infty} f(x) = 0$ $f(x) =$	Has a slant asymptote. $g(x) =$
As the x values increase without bound, the y values decrease without bound. $h(x) =$	Horizontal asymptote of $y = 5$. $j(x) =$

COMPLETE THE LIMIT STATEMENTS

Determine which function must be written in the blanks of each pair of limit statements to create true statements regarding the end behavior.

$$f(x) = \frac{4x^2 - 2x + 1}{x + 3} \qquad g(x) = \frac{(2x-1)(2x+3)}{-(x-1)(x+1)}$$

$$h(x) = \frac{x}{x^2 - 1} \qquad j(x) = \frac{-9x^5 - 4}{-2x}$$

$\lim_{x \to -\infty}$ ____ $= -4$ $\lim_{x \to \infty}$ ____ $= -4$	$\lim_{x \to -\infty}$ ____ $= -\infty$ $\lim_{x \to \infty}$ ____ $= \infty$
$\lim_{x \to -\infty}$ ____ $= \infty$ $\lim_{x \to \infty}$ ____ $= \infty$	$\lim_{x \to -\infty}$ ____ $= 0$ $\lim_{x \to \infty}$ ____ $= 0$

BUILDING RATIONAL FUNCTIONS

Arrange the expression pieces below (as numerators and denominators) to build functions with the following end behaviors. Each piece may only be used once.

$\lim_{x\to-\infty} f(x) = \infty$ $\lim_{x\to\infty} f(x) = -\infty$	$\lim_{x\to-\infty} g(x) = 4$ $\lim_{x\to\infty} g(x) = 4$	$\lim_{x\to-\infty} h(x) = 0$ $\lim_{x\to\infty} h(x) = 0$	$\lim_{x\to-\infty} j(x) = -\infty$ $\lim_{x\to\infty} j(x) = -\infty$

$\boldsymbol{f(x) =}$ ________________	$\boldsymbol{g(x) =}$ ________________
$\boldsymbol{h(x) =}$ ________________	$\boldsymbol{j(x) =}$ ________________

$2x^2$	$-2x^2$
$8x$	$-8x^3 - 2$
$-8x^2 - 2x - 9$	$8x^4$
$-(x+2)(x-2)$	$18x^5 - 4$

$2x^2$	$-2x^2$
$8x$	$-8x^3 - 2$
$-8x^2 - 2x - 9$	$8x^4$
$-(x+2)(x-2)$	$18x^5 - 4$

$2x^2$	$-2x^2$
$8x$	$-8x^3 - 2$
$-8x^2 - 2x - 9$	$8x^4$
$-(x+2)(x-2)$	$18x^5 - 4$