January 31

Without talking...
write down your prediction for the super bowl?
(score, best commercial, weather, the number of times we hear "Ohama", the number in attendance, etc.)

January 31

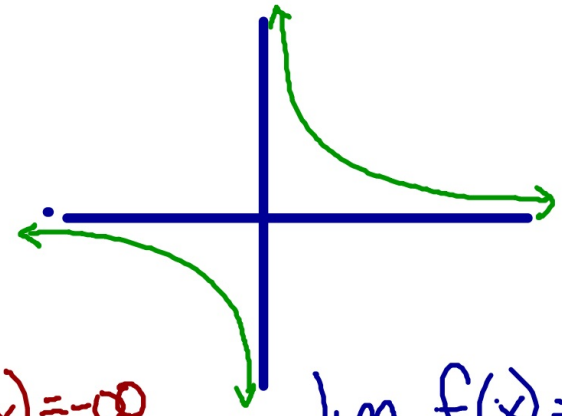
Students will verbally explain how to find vertical asymptotes
(using the words:
factor, simplify, evaluate...)

f(x) = 1/x

$f(x)=\frac{1}{x}$

Is f(x) continuous?

No, when x=0, f(x) is undefined



$\lim_{x\to 0^-} f(x) = -\infty$

$\lim_{x\to 0^+} f(x) = \infty$

Vertical Asymptote

If $\lim_{x\to a^+} f(x) = \pm\infty$

(or $\lim_{x\to a^-} f(x) = \pm\infty$)

Then x = a is a vertical asymptote

$\lim_{x\to a} f(x) = \frac{\text{not zero}}{\text{zero}} = \pm\infty$

$$f(x) = \frac{x^2 + 3x - 5}{x - 4}$$

Find the vertical asymptotes and the one-sided limits

① set the denominator equal to zero + solve

$x-4=0$

$x=4$

② find the one sided limits (limits from the right + left)

$\lim_{x\to 4^+} \frac{x^2+3x-5}{x-4} = \frac{4^2+3(4)-5}{4-4} = \frac{23}{0}$ ← positive

✓ the sign of the denominator (use a # a little bigger than 4)

$4.1-4=0.1$ ← positive

$\frac{\text{positive}}{\text{positive}} = \text{positive}$ $\quad \lim_{x\to 4^+} f(x) = +\infty$

$\lim_{x\to 4^-} \frac{x^2+3x-5}{x-4} = \frac{4^2+3(4)-5}{4-4} = \frac{23}{0}$ ← positive

✓ the sign of the denominator

$3.8-4=-0.2$ ← negative

$\frac{\text{positive}}{\text{negative}} = \text{negative}$ $\quad \lim_{x\to 4^-} f(x) = -\infty$

$$f(x) = \frac{x^2 - 7x - 10}{x - 6}$$

$\lim_{x\to 6^-} f(x) = +\infty$

$\lim_{x\to 6^+} f(x) = -\infty$

$$f(x) = \frac{x+2}{(x-3)^2}$$