DIRECTIONS: For each function, name the x-coordinate of any discontinuities and tell if they are removable (hole in the graph) or infinite (vertical asymptote). Also, use end behavior to determine any horizontal asymptotes.

1)
$$f(x) = \frac{x-9}{2x-6} = \frac{x-9}{2(x-3)}$$

Location of discontinuity: X=3 Type of discontinuity: Verh Cal asymptote

x	-1,000,000,000	-1,000,000	1,000,000	1,000,000,000
f(x)	0.500	0.500	. 4 999	. 49999

$$\lim_{x\to\infty}f(x)=\underline{\mathbf{0.5}}$$

Horizontal Asymptote: <u>y=0.5</u>

$$\lim_{x\to-\infty}f(x)=\underline{\mathbf{0.5}}$$

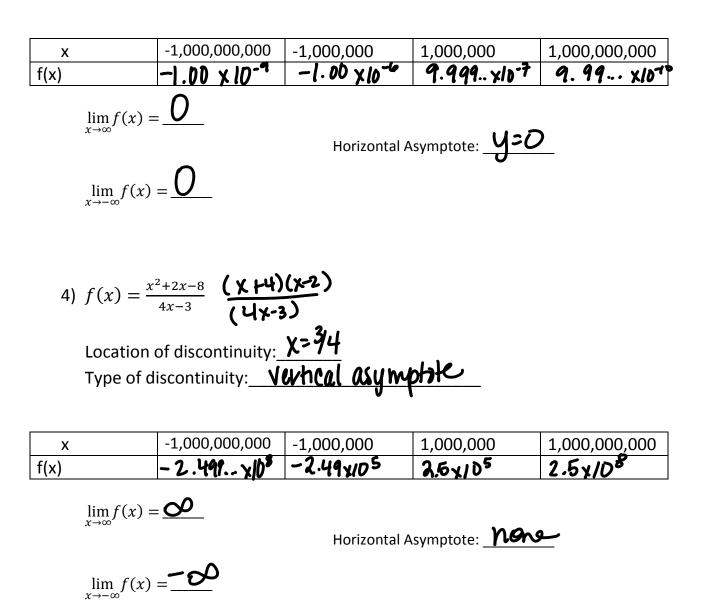
2)
$$f(x) = \frac{6x^2}{2x^2 - 8} = \frac{12x^2}{2(x^2 - 4)} = \frac{12x^2}{2(x - 2)(x + 2)}$$

Locations of discontinuities: X=2, X=-2. Type of discontinuities: Verh Cal Asymptotes

x	-1,000,000,000	-1,000,000	1,000,000	1,000,000,000		
f(x)	3	3	3	3		
$\lim_{x \to \infty} f(x) = \underline{3}$ Horizontal Asymptote: $\underline{y=3}$						

3)
$$f(x) = \frac{1}{x+6}$$

Location of discontinuity: X=-6 Type of discontinuity: Vertical asymptote



***Do you think you can come up with the end behavior for rational functions just by looking at the equation?