Name ____________________

# Properties of Infinite Limits

Date ____________ Period ______

Given the following…

$$\lim_{x \to c} f(x) = \infty \qquad \lim_{x \to c} g(x) = L$$

## Sum or Difference Property

$$\lim_{x \to c} [f(x) \pm g(x)] = \lim_{x \to c} f(x) \pm \lim_{x \to c} g(x) = \infty \pm L = \infty$$

Infinity always dominates

Given the following…

$$\lim_{x \to c} f(x) = -\infty \qquad \lim_{x \to c} g(x) = L$$

## Sum or Difference Property

$$\lim_{x \to c} [f(x) \pm g(x)] = \lim_{x \to c} f(x) \pm \lim_{x \to c} g(x) = -\infty \pm L = -\infty$$

Infinity always dominates

Given the following…

$$\lim_{x \to c} f(x) = \infty \qquad \lim_{x \to c} g(x) = L$$

Product Property

$$\lim_{x \to c} [f(x) \cdot g(x)] = \lim_{x \to c} f(x) \cdot \lim_{x \to c} g(x) \quad = \infty \cdot L \quad = \infty \qquad , L > 0$$

$$= \infty \cdot L \quad = -\infty \qquad , L < 0$$

Infinity always dominates

Given the following…

$$\lim_{x \to c} f(x) = -\infty \qquad \lim_{x \to c} g(x) = L$$

Product Property

$$\lim_{x \to c} [f(x) \cdot g(x)] = \lim_{x \to c} f(x) \cdot \lim_{x \to c} g(x) \quad = -\infty \cdot L \quad = -\infty \qquad , L > 0$$

$$= -\infty \cdot L \quad = \infty \qquad , L < 0$$

Infinity always dominates

Given the following…

$$\lim_{x \to c} f(x) = \infty \qquad \lim_{x \to c} g(x) = L$$

Quotient Property

$$\lim_{x \to c} \frac{g(x)}{f(x)} = \frac{\lim_{x \to c} g(x)}{\lim_{x \to c} f(x)} = \frac{L}{\infty} = 0$$

Infinity always dominates

Given the following…

$$\lim_{x \to c} f(x) = -\infty \qquad \lim_{x \to c} g(x) = L$$

Quotient Property

$$\lim_{x \to c} \frac{g(x)}{f(x)} = \frac{\lim_{x \to c} g(x)}{\lim_{x \to c} f(x)} = \frac{L}{-\infty} = 0$$

Infinity always dominates