

## Warm-Up

1. Explain in your own words what is meant by the equation  $\lim_{x \rightarrow 2} f(x) = 5$

Is it possible for this statement to be true and yet  $f(2) = 3$ ? Explain.

2. Explain what it means to say that

$$\lim_{x \rightarrow 1^-} f(x) = 3 \quad \text{and} \quad \lim_{x \rightarrow 1^+} f(x) = 7$$

In this situation, it is possible that  $\lim_{x \rightarrow 1} f(x)$  exists?

Aug 30-4:06 PM

Given that  $\lim_{x \rightarrow a} f(x) = -3$ ,  $\lim_{x \rightarrow a} g(x) = 0$ ,  $\lim_{x \rightarrow a} h(x) = 8$ , find the limits that exist. If the limit does not exist, explain why.

(a)  $\lim_{x \rightarrow a} [f(x) + h(x)] =$

(b)  $\lim_{x \rightarrow a} [f(x)]^2 =$

(c)  $\lim_{x \rightarrow a} \sqrt[3]{h(x)} =$

(d)  $\lim_{x \rightarrow a} \frac{1}{f(x)} =$

(e)  $\lim_{x \rightarrow a} \frac{f(x)}{h(x)} =$

(f)  $\lim_{x \rightarrow a} \frac{g(x)}{f(x)} =$

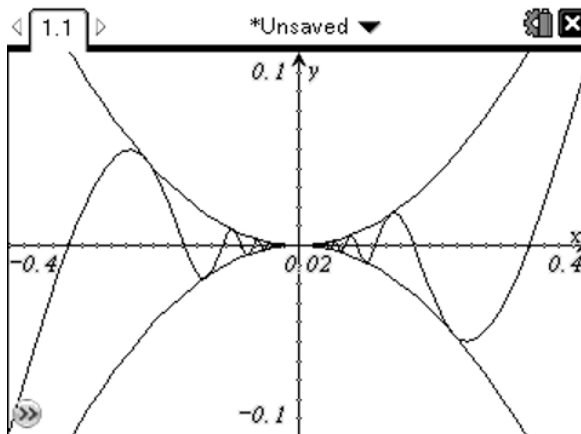
(g)  $\lim_{x \rightarrow a} \frac{f(x)}{g(x)} =$

(h)  $\lim_{x \rightarrow a} \frac{2f(x)}{h(x) - f(x)} =$

Sep 1-12:12 PM

## The Sandwich Theorem

Estimate  $\lim_{x \rightarrow 0} \left( x^2 \sin \frac{1}{x} \right)$



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If  $g(x) \leq f(x) \leq h(x)$  for all  $x$  except possibly  $x=c$   
and

$$\lim_{x \rightarrow c} g(x) = \lim_{x \rightarrow c} h(x) = L \quad \text{then} \quad \lim_{x \rightarrow c} f(x) = L$$

Sep 1-3:51 PM

If  $1 \leq f(x) \leq x^2 + 2x + 2$  for all  $x$ , find  $\lim_{x \rightarrow -1} f(x)$

If  $3x \leq f(x) \leq x^3 + 2$ , evaluate  $\lim_{x \rightarrow 1} f(x)$ .

Sep 1-3:51 PM

$$\lim_{x \rightarrow 0} \frac{\sin 2x}{x}$$

$$\lim_{x \rightarrow 0} \frac{\sin 5x}{2x}$$

$$\lim_{x \rightarrow 0} \frac{x + \sin x}{x} =$$

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$$\lim_{x \rightarrow 0} \frac{\sin x}{2x^2 - x} =$$

$$\lim_{x \rightarrow 0} \frac{\sin^2 x}{x} =$$

Sep 1-4:13 PM