

JANUARY 24

In a well written paragraph, explain the process for finding the limit with each method.

(graphical, numerical, algebraic)

Which method do you like the best? Why?

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Students will verbally explain how to evaluate limits using basic limit laws

(using the words:  
sum, product, constant...)

# Properties of Limits (Basic Limit Laws)

Sum	$\lim_{x \rightarrow c} (f(x) + g(x)) = \lim_{x \rightarrow c} f(x) + \lim_{x \rightarrow c} g(x)$									
Product	$\lim_{x \rightarrow c} (f(x) \cdot g(x)) = \lim_{x \rightarrow c} f(x) \cdot \lim_{x \rightarrow c} g(x)$									
Constant Multiple	$\lim_{x \rightarrow c} k \cdot f(x) = k \cdot \lim_{x \rightarrow c} f(x)$									
Quotient	$\lim_{x \rightarrow c} \left( \frac{f(x)}{g(x)} \right) = \frac{\lim_{x \rightarrow c} f(x)}{\lim_{x \rightarrow c} g(x)}$									
$\lim_{x \rightarrow c} \left( \frac{f(x)}{g(x)} \right) =$	<table><tr><td><math display="block">\lim_{x \rightarrow c} (f(x) \cdot g(x)) =</math></td><td><math display="block">\lim_{x \rightarrow c} (f(x) + g(x)) =</math></td><td><math display="block">\lim_{x \rightarrow c} k \cdot f(x) =</math></td></tr><tr><td><math display="block">k \cdot</math></td><td><math display="block">+</math></td><td><math display="block">\lim_{x \rightarrow c} f(x)</math></td></tr><tr><td></td><td></td><td><math display="block">\lim_{x \rightarrow c} g(x)</math></td></tr></table>	$\lim_{x \rightarrow c} (f(x) \cdot g(x)) =$	$\lim_{x \rightarrow c} (f(x) + g(x)) =$	$\lim_{x \rightarrow c} k \cdot f(x) =$	$k \cdot$	$+$	$\lim_{x \rightarrow c} f(x)$			$\lim_{x \rightarrow c} g(x)$
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$k \cdot$	$+$	$\lim_{x \rightarrow c} f(x)$								
		$\lim_{x \rightarrow c} g(x)$								

Given

$$\lim_{x \rightarrow 3} f(x) = 7$$

$$\lim_{x \rightarrow 3} g(x) = 5$$

Find

$$\lim_{x \rightarrow 3} (f(x) \cdot g(x)) = \overset{=7}{\lim_{x \rightarrow 3} f(x)} \cdot \overset{=5}{\lim_{x \rightarrow 3} g(x)} = 7(5) = 35$$

$$\lim_{x \rightarrow 3} (f(x) + g(x)) = \lim_{x \rightarrow 3} f(x) + \lim_{x \rightarrow 3} g(x) = 7 + 5 = 12$$

$$\lim_{x \rightarrow 3} (20 - f(x)) = \lim_{x \rightarrow 3} 20 - \lim_{x \rightarrow 3} f(x) = 20 - 7 = 13$$

$$\lim_{x \rightarrow 3} (6g(x)) = 6 \cdot \lim_{x \rightarrow 3} g(x) = 6(5) = 30$$

$$\begin{aligned} \lim_{x \rightarrow 3} (4x^2 + g(x)) &= \lim_{x \rightarrow 3} 4x^2 + \lim_{x \rightarrow 3} g(x) \\ &= 4(3)^2 + 5 = 36 + 5 = 41 \end{aligned}$$