Pre-Calculus
Limits at a Point – Day 3

Name:
Date: Period:

Use the given information to evaluate the limit.

1) $\lim_{x\to c} f(x)=3, \quad \lim_{x\to c} g(x)=6$

a) $\lim_{x\to c}\left[-2g(x)\right]$ b) $\lim_{x\to c}\left[f(x)+g(x)\right]$

c) $\lim_{x\to c}\dfrac{f(x)}{g(x)}$ d) $\lim_{x\to c}\sqrt{f(x)}$

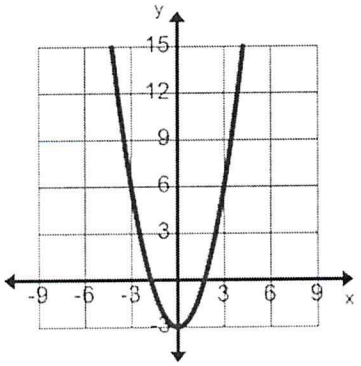
2) $f(x)=x^3, \quad g(x)=\dfrac{\sqrt{x^2+5}}{2x^2}$

a) $\lim_{x\to 2} f(x)$ b) $\lim_{x\to 2} g(x)$

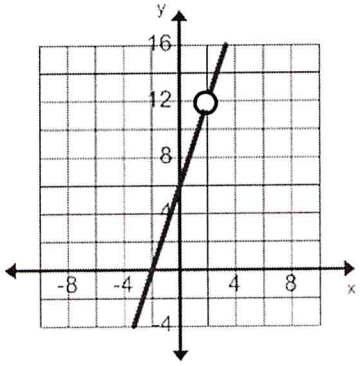
c) $\lim_{x\to 2}\left[f(x)g(x)\right]$ d) $\lim_{x\to 2}\left[g(x)-f(x)\right]$

Use the graph to find the limit (if it exists). If the limit does not exist, explain why.

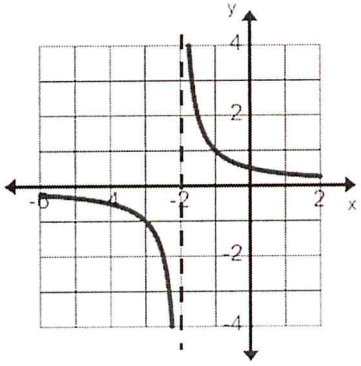
3) $\lim_{x\to -4}\left(x^2-3\right)$



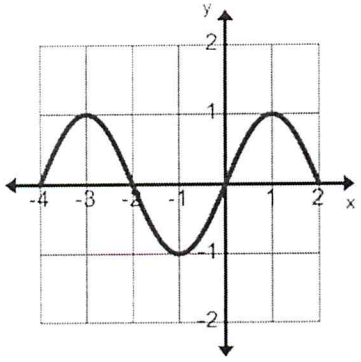
4) $\lim_{x\to 2}\dfrac{3x^2-12}{x-2}$



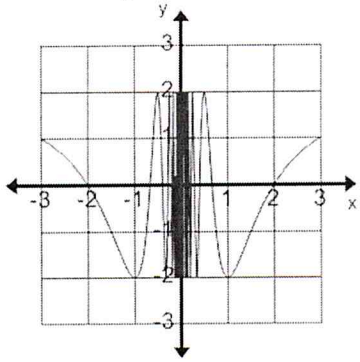
5) $\lim_{x\to -2}\dfrac{x-2}{x^2-4}$



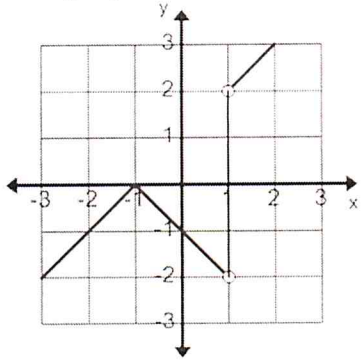
6) $\lim_{x\to -1}\sin\left(\dfrac{\pi x}{2}\right)$



7) $\lim_{x\to 0} 2\cos\dfrac{\pi}{x}$



8) $\lim_{x\to 1}\dfrac{\left|x^2-1\right|}{x-1}$



Determine whether the limit exists. If the limit exists, find it. If the limit does not exist, explain why.

9) $\lim_{x\to 1}\dfrac{x-1}{x^2-4x+3}$

10) $\lim_{x\to 3}\dfrac{7}{x-3}$

11) $\lim_{x\to 5}\left(10-x^2\right)$

12) $\lim_{x\to \pi}\sin 2x$

13) $\lim_{x\to -2}\dfrac{5x+3}{2x-9}$

14) $\lim_{x\to 3}\sqrt[3]{x^2-1}$

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Use the given information to evaluate the limit.

1) $\lim_{x\to c} f(x)=3, \quad \lim_{x\to c} g(x)=6$

a) $\lim_{x\to c}[-2g(x)]$ $= -2(6) = -12$

b) $\lim_{x\to c}[f(x)+g(x)]$ $= 3+6 = 9$

c) $\lim_{x\to c}\frac{f(x)}{g(x)} = \frac{3}{6} = \frac{1}{2}$

d) $\lim_{x\to c}\sqrt{f(x)} = \sqrt{3}$

2) $f(x)=x^3, \quad g(x)=\frac{\sqrt{x^2+5}}{2x^2}$

a) $\lim_{x\to 2} f(x) = 8$

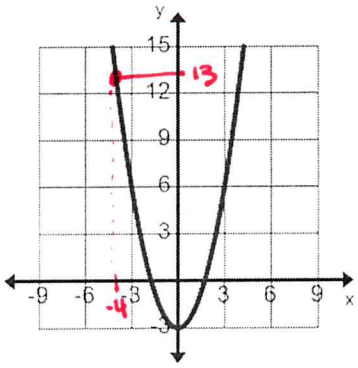
b) $\lim_{x\to 2} g(x) = \frac{3}{8}$

c) $\lim_{x\to 2}[f(x)g(x)]$ $= 8\left(\frac{3}{8}\right) = 3$

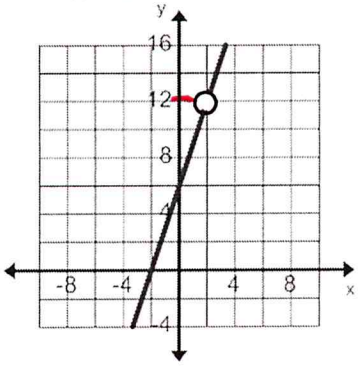
d) $\lim_{x\to 2}[g(x)-f(x)]$ $= \frac{3}{8} - 8 = -\frac{61}{8}$

Use the graph to find the limit (if it exists). If the limit does not exist, explain why.

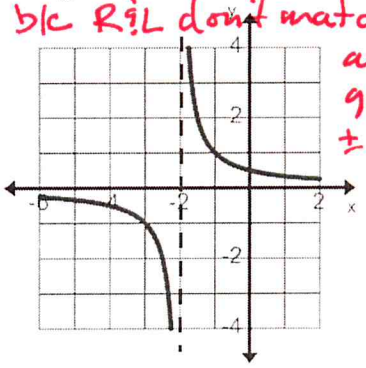
3) $\lim_{x\to -4}(x^2-3) = 16-3 = 13$



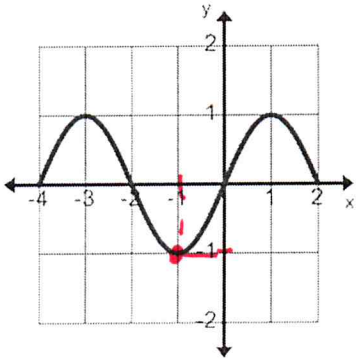
4) $\lim_{x\to 2}\frac{3x^2-12}{x-2} = 12$



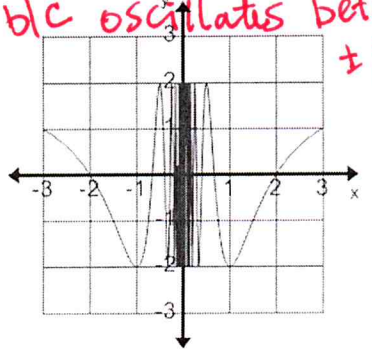
5) $\lim_{x\to -2}\frac{x-2}{x^2-4}$ = DNE
b/c R & L don't match and go to $\pm\infty$.



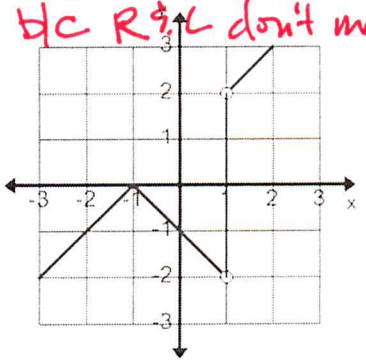
6) $\lim_{x\to -1}\sin\left(\frac{\pi x}{2}\right) = -1$



7) $\lim_{x\to 0} 2\cos\frac{\pi}{x}$ DNE
b/c oscillates between ± 2.



8) $\lim_{x\to 1}\frac{|x^2-1|}{x-1}$ = DNE
b/c R & L don't match



Determine whether the limit exists. If the limit exists, find it. If the limit does not exist, explain why.

9) $\lim_{x\to 1}\frac{x-1}{x^2-4x+3} = -\frac{1}{2}$

10) $\lim_{x\to 3}\frac{7}{x-3}$ DNE
b/c R & L don't match AND go to $\pm\infty$

11) $\lim_{x\to 5}(10-x^2) = 10-25$
~~#45~~ $= -15$

12) $\lim_{x\to \pi}\sin 2x =$
$\sin 2\pi = 0$

13) $\lim_{x\to -2}\frac{5x+3}{2x-9} = \frac{-7}{-13} = \frac{7}{13}$

14) $\lim_{x\to 3}\sqrt[3]{x^2-1} = \sqrt[3]{9-1}$
$= \sqrt[3]{8} = 2$