

Name: _____ Date: _____ Period: _____

Mid-Unit 1 Review – Limits

Lessons 1.1 through 1.9

Reviews do NOT cover all material from the lessons but will hopefully remind you of key points. To be prepared, you must study all packets from Unit 1.

A salesman tracks the number of cars he sells through the model c , where $c(m)$ is number of cars sold and m is the month for $0 \leq m \leq 24$.

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|---------------------------------|---|---|
| 1. What does $c(10)$ represent? | 2. What does $\frac{c(16)-c(8)}{16-8}$ represent? | 3. What does $\frac{c(7)-c(6.999)}{7-6.999}$ represent? |
|---------------------------------|---|---|

Evaluate the limit.

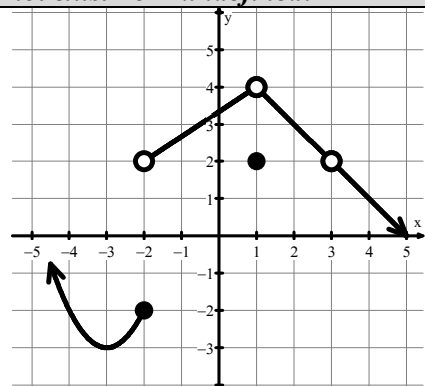
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|---|---|---|
| 4. $\lim_{x \rightarrow 0} \frac{\sqrt{x+19}-\sqrt{19}}{x}$ | 5. $\lim_{x \rightarrow -3} \frac{x+3}{x^2+2x-3}$ | 6. $\lim_{x \rightarrow 0} \frac{\sin^2(3x)}{\sin^2(5x)}$ |
| 7. $\lim_{x \rightarrow 2^-} \frac{ x-2 }{x-2}$ | 8. $\lim_{x \rightarrow 10} \frac{x^2-5x-50}{x-10}$ | 9. $\lim_{x \rightarrow 0} \frac{\frac{1}{x+1}-1}{x}$ |

10. If $f(x) = \begin{cases} \sin x, & x < -\pi \\ \tan x & -\pi < x < \frac{\pi}{4} \\ \cos x, & x \geq \frac{\pi}{4} \end{cases}$, find the following:

a. $\lim_{x \rightarrow -\pi^-} f(x) =$ b. $\lim_{x \rightarrow -\pi} f(x) =$
c. $\lim_{x \rightarrow \frac{\pi}{4}} f(x) =$ d. $f\left(\frac{\pi}{4}\right) =$

Give the value of each statement. If the value does not exist, write “does not exist” or “undefined.”

11. $\lim_{x \rightarrow 3} f(x) =$ 15. $\lim_{x \rightarrow 2} f(x) =$
12. $\lim_{x \rightarrow 1} f(x) =$ 16. $\lim_{x \rightarrow -2^+} f(x) =$
13. $f(3) =$ 17. $f(1) =$
14. $f(-2) =$ 18. $\lim_{x \rightarrow -2^-} f(x) =$



19. Let g and h be the functions defined by $g(x) = -\frac{1}{4}x^2 - \frac{1}{2}x - \frac{9}{4}$ and $h(x) = \sin\left(\frac{\pi}{2}x\right) - 1$. If f is a function that satisfies $g(x) \leq f(x) \leq h(x)$ for all x , what is $\lim_{x \rightarrow -1} f(x)$?

CALCULATOR ALLOWED:

20. If $f(x) = \frac{x^2 + 10x + 21}{x + 3}$, create your own table of values to help you evaluate $\lim_{x \rightarrow -3} f(x)$.

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

x						
$f(x)$						