ICMAB Test 2 Review Part 2 Name______________________

Find the Limit.

1. $\lim_{x\to 0} \frac{\sin(5x)}{\cos(4x)} =$ 0

2. $\lim_{x\to 0} \frac{\sin^2(3x)}{x^2\cos(x)} =$ 9

3. $\lim_{x\to 0} \frac{\sin(5x)}{\sin\left(\frac{1}{3}x\right)} =$ 15

4. $\lim_{x\to 0} \frac{x}{\tan(x)} =$ 1

5. $\lim_{x\to \frac{\pi}{2}} \frac{1+\sin(x)}{1-\cos(x)} =$ 2

6. $\lim_{x\to \infty} \frac{\cos(2x)}{x^2} =$ 0

7. $\lim_{x\to \infty} \frac{6x^3-5x}{x^2+4x^3} =$ 3/2

8. $\lim_{x\to b} \frac{4a^2-x^2}{2a+x} =$ 2a-b

9. $\lim_{x\to -\infty} \frac{8x^3-5x}{x^2-3x} =$ $-\infty$

10. $\lim_{x\to \infty} \frac{x^2+x^4}{x^2+x^6} =$ 0

11. $\lim_{x\to 2} \frac{4x^3-32}{5x^2-20} =$ 12/5

12. $\lim_{x\to 4^-} \frac{5}{x-4} =$ $-\infty$

13. $\lim_{x\to 0^+} \frac{4}{x}\sin\left(\frac{x}{5}\right) =$ 4/5

14. $\lim_{x\to 1} \frac{4x^3-5}{5x^2-6} =$ 1

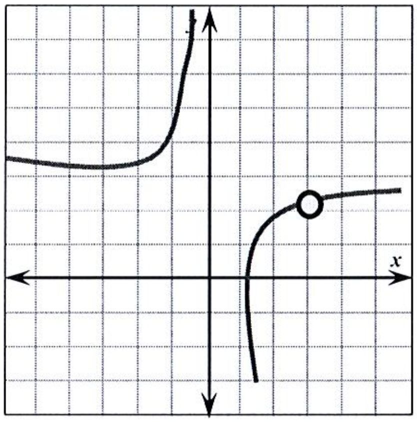
15. $\lim_{x\to 2^+} \frac{2x-2}{x-4} =$ -1

16. $\lim_{x\to \infty} \frac{8x^2-2x^3}{2x^2+4x} =$ $-\infty$

17. $\lim_{h\to 0} \frac{[4(x+h)-1]-(4x-1)}{h} =$ 4

18. $\lim_{x\to -15^-} \frac{|x+15|}{x+15} =$ -1.

19. Use the graph of f(x) below to answer A – C.



$f(3) = 3,$
$\lim_{x \to 3}$ exists
$f(3) \neq \lim_{x \to 3} f(x)$
$\therefore$ f(x) is not continuous

A. Use the 3 –part definition of continuity to show if f(x) is continuous at x = 3.

B. What type(s) of discontinuity are shown in the graph of f(x)?

x = 3 removable

C. Is there a removable discontinuity? If so, assign a value to remove it.

$f(3) = 2$

20. If $f(x) = \begin{cases} 2x-1 & \text{if } x \leq 1 \\ -3x & \text{if } x > 1 \end{cases}$, use the definition to show if f(x) continuous at x = 1.

$f(1) = 1$ $\lim_{x \to 1} f(x)$ DNE $\therefore$ f(x) is not continuous

21. If $h(x) = \begin{cases} \dfrac{x^2 + 6x + 8}{x + 2} & x \neq -2 \\ 2 & x = -2 \end{cases}$ use the definition to show if h(x) continuous at x = -2.

$f(-2) = 2$ $\lim_{x \to 2}$ exists $f(-2) = \lim_{x \to 2} f(x) = 2$ $\therefore$ f(x) continuous

22. If $f(x) = \dfrac{x^3 + 8}{x - 4}$, use the definition to show if f(x) continuous at x = -2.

$f(-2)$ DNE $\therefore$ f(x) is not continuous

23. When $f(x) = \dfrac{x^3 + 64}{x - 4}$, then f(x) has continuous at a point of discontinuity. Assign a value to f(x) that removes the discontinuity. $f(4) = 48$ $\lim x^2 + 4x + 16 = 48$

24.

A. $\lim_{x \to 1^+} f(x) =$ 1 B. $\lim_{x \to 1^-} f(x) =$ -2 C. $\lim_{x \to 1} f(x) =$ DNE

D. $\lim_{x \to -1} f(x) =$ 2 E. $\lim_{x \to 2} f(x) =$ 1