AP Calc WS# 7 Limits and Continuity Test Review Name: \_\_\_\_\_\_\_\_\_\_\_\_

Part A The use of a calculator is not allowed.

Find the limits of the following:

1. $\lim\_{x\to 0}(x-5)cosx$ 2. $\lim\_{x\to b}\frac{x^{3}-b^{3}}{x^{6}-b^{6}}$

3. $\lim\_{x\to 0}\frac{2-\sqrt{4-x}}{x}$ 4. $\lim\_{x\to \infty }\frac{5-6x}{2x+11}$

5. $\lim\_{x\to -\infty }\frac{x^{2}+2x-3}{x^{3}+2x^{2}}$ 6. $\lim\_{x\to \infty }\frac{3x^{2}}{5x+8}$

7. $\lim\_{x\to -\infty }\frac{3x}{\sqrt{x^{2}-4}}$ 8. $\lim\_{x\to \infty }\frac{e^{x}}{1-x^{3}}$

9. If $f\left(x\right)=\left\{\begin{array}{c}e^{x}for0\leq x<1\\x^{2}e^{x}for1\leq x\leq 5\end{array}\right\} $find$\lim\_{x\to 1}f(x)$

10. $\lim\_{x\to 0}\frac{sin(3x)}{sin(4x)}$ 11. $\lim\_{x\to 3^{+.}}\frac{\sqrt{t^{2}-9}}{t-3}$

12. The graph of a function *f* is shown .

Which of the following statements is/are true?

a.$\lim\_{x\to 4^{-.}}f(x)=5$

b.$\lim\_{x\to 4^{+.}}f(x)=2$

c. f(4) = 5

d. $\lim\_{x\to 4^{.}}f\left(x\right)=DNE$

13. Find the value of a so that the function is continuous



Part B Calculators are allowed.

13. Find the horizontal and vertical asymptotes of the graph of the function $f(x)=\frac{1}{x^{2}+x-2}$

14. Find the limit $\lim\_{x\to 5^{+.}}\frac{5+[x]}{5-x}$when [x] is the greatest integer of x

15. Find the points of discontinuity of the function $f(x)=\frac{x+1}{x^{2}+4x-12}$

16. For what value of k is the function $g(x)=\left\{\begin{array}{c}x^{2}+5x\leq 3\\2x-kx>3\end{array}\right\}$continuous at x = 3

17. Determine if $f(x)=\left\{\begin{array}{c}\frac{x^{2}+5x-14}{x-2} if x\ne 2\\12 if x=2\end{array}\right\}$ is continuous at x =2. Explain why or why not.

18. Given f(x) as shown, find

* 1. f (3) b. $\lim\_{x\to 3+}f(x)$

c. $\lim\_{x\to 3-}f(x)$ d. $\lim\_{x\to 3}f(x)$

e. Is f(x) continuous at x =3? Explain

19. A function f is continuous on [–2, 2] and some of the values of f are shown below:

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| --- | --- | --- | --- |
| x | -2 | 0 | 2 |
| f(x) | 3 | b | 4 |

 | If f has only one root, r, on the closed interval [–2, 2] then a possible value of b is a. –3 b. –2 c. –1 d. 0 e. 1 |

20. Evaluate $\lim\_{x\to 0}\frac{1-cosx}{sin^{2}x}$