Limit Review

Name: _____ **Date:** _____

1. $\lim_{\theta \to 0} \dfrac{\sin(\theta + h) - \sin\theta}{h} =$

   A. $-\cos\theta$ B. $\cos\theta$

   C. $2\cos\theta$ D. $-2\cos\theta$

2. $\lim_{x \to \infty} \dfrac{2\ln 3x}{x}$ is

   A. 1 B. 0 C. $\frac{e}{3}$ D. e

3. $\lim_{x \to 2^+} \dfrac{x+5}{x-2}$ is

   A. 1 B. 2 C. $-\infty$ D. ∞

4. $\lim_{x \to 7} \dfrac{1}{(x-7)^2} =$

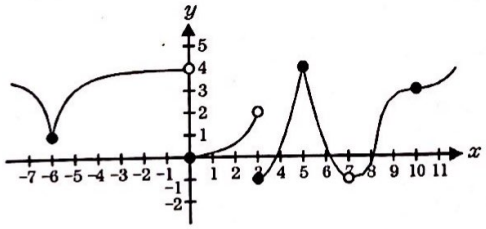
   A. ∞ B. 0

   C. 7 D. no limit

5. $\lim_{x \to -\frac{1}{3}} \dfrac{27x^3 + 1}{6x^2 - x - 1} =$

   A. 0 B. $\frac{1}{5}$ C. –9/5 D. -5

6. The figure below shows the graph of f. Use the figure to answer the following question(s).



   $\lim_{x \to 0^-} f$ is

   A. 1 B. –1 C. 4

   D. no limit

7. $\lim_{x \to -\infty} \dfrac{x}{(x-5)(x+7)}$ is

   A. 1 B. $-\infty$ C. 0 D. ∞

8. Which of the following functions has a horizontal asymptote at $y = 2$?

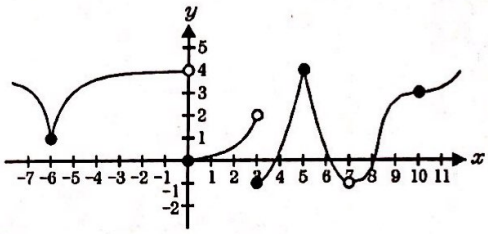
   A. $\dfrac{2x}{\sqrt{x-2}}$ B. $\dfrac{2x^2 - 6x + 1}{1 + x^2}$

   C. $\dfrac{2x-1}{x^2+1}$ D. $\dfrac{5 - 2x^2}{7 + x^3}$

9. $\lim_{x \to 7^-} \dfrac{|x-7|}{x-7} =$

   A. 1 B. –1 C. ∞ D. ± 1

10. The figure below shows the graph of f. Use the figure to answer the following question(s).



    $\lim_{x \to 5} f$ is

    A. 1 B. 2 C. 4

    D. no limit

11. $\lim_{h \to 9} \dfrac{x-9}{\sqrt{x}-3} =$

    A. ∞ B. 0

    C. 6 D. no limit

12. $\lim_{x\to\infty} \frac{e^{5x}}{\ln 2x}$ is

A. 0 B. $\frac{5}{2}$ C. $5e$ D. ∞

13. $\lim_{x\to\pi^-} \frac{\cos x}{x-\pi} =$

A. ∞ B. 0 C. $-\infty$ D. $\frac{1}{pi}$

14. $\lim_{x\to 9} \frac{\sqrt{x}-7}{x-49} =$

A. 0 B. $-\frac{1}{7}$

C. $\frac{1}{10}$ D. undefined

15. $\lim_{x\to\infty} \frac{5x^2}{9-x^2}$ is

A. $-\infty$ B. ∞ C. 3 D. -5

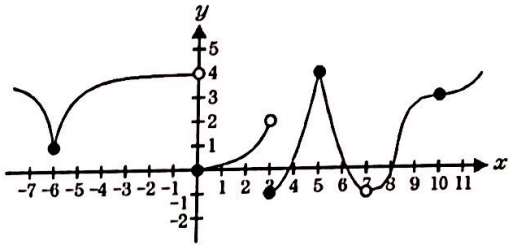
16. $\lim_{h\to 0} \frac{\frac{1}{x+h}-\frac{1}{x}}{h} =$

A. $-x^2$ B. $-\frac{1}{x^2}$ C. x^2 D. $-\frac{1}{x}$

17. $\lim_{x\to -2^-} \frac{x}{(x+2)(x-3)}$ is

A. 1 B. $-\infty$ C. 0 D. ∞

18. The figure below shows the graph of f. Use the figure to answer the following question(s).



At which of the following x-values does f have a removeable discontinuity? Choose the BEST answer.

I. -6

II. 0

III. 3

IV. 5

V. 7

VI. 10

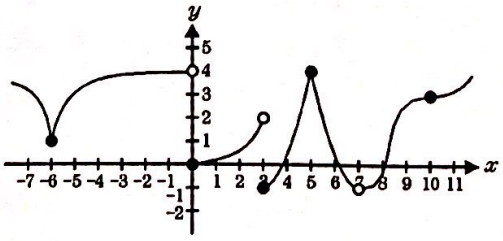
A. I, II, and IV B. IV and VI

C. II, III, and V D. V only

19. $\lim_{x\to\infty} \frac{3x^4-5x^3+709}{7x^4+9x^2+11}$ is

A. $-\frac{3}{7}$ B. $\frac{3}{7}$ C. 0 D. 3

20. The figure below shows the graph of f. Use the figure to answer the following question(s).



$\lim_{x\to 3} f$ is

A. 2 B. 3 C. -1

D. no limit

21. $\lim_{h\to\infty} \frac{5}{\sqrt{h+7}}$ is

A. 1 B. 0 C. $\frac{1}{3}$ D. ∞

22. If $f(x) = \frac{4x}{\sqrt{x^2+9}}$, find all horizontal asymptotes.

A. $y = \pm 1$ B. $y = 4$ only

C. $y = \pm 4$ D. $y = 3$

23. $\lim_{x\to-\infty} \frac{2-2^x}{5-5^x}$ is

A. 1 B. 2 C. 0 D. $\frac{2}{5}$

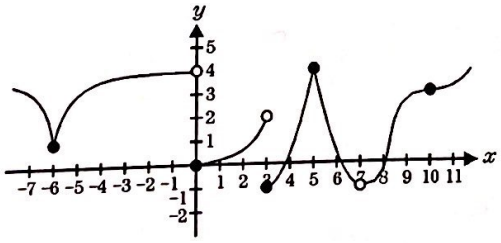
24. $\lim_{x\to 2} \frac{\frac{1}{x}-\frac{1}{2}}{x-2} =$

A. $\frac{1}{2}$ B. $\frac{1}{4}$ C. $\frac{1}{8}$ D. $-\frac{1}{4}$

25. $\lim_{h\to 0} \frac{3(x+h)^2-3x^2}{h} =$

A. $6xh$ B. $6x$ C. $3x$ D. 3

26. The figure below shows the graph of f. Use the figure to answer the following question(s).



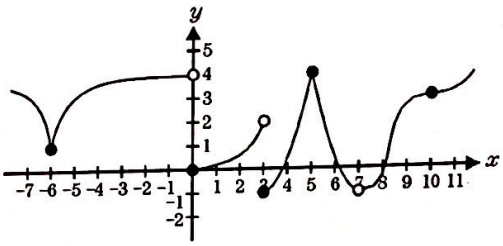
$\lim_{x\to 7} f$ is

A. 1 B. 2 C. -1 D. 0

27. $\lim_{x\to 0^-} \frac{3}{x}$ is

A. 1 B. 2 C. $-\infty$ D. ∞

28. The figure below shows the graph of f. Use the figure to answer the following question(s).



$\lim_{x\to 3^+} f$ is

A. -1 B. 3 C. 0

D. no limit

29. $\lim_{x\to\infty} \ln(3x-7)$ is

A. 1 B. 1^- C. 1^+ D. ∞

30. $\lim_{x\to 5^+} \frac{x|x-5|}{x-5}$ is

A. 1 B. 5 C. 4 D. 0