

Name _____

LIMITS REVIEW WORKSHEETS

I. Find the limits:

1. $\lim_{x \rightarrow 8} (7)$
2. $\lim_{x \rightarrow -\infty} (-3)$
3. $\lim_{x \rightarrow 0^+} (\pi)$
4. $\lim_{y \rightarrow -2} (3x)$
5. $\lim_{y \rightarrow 3^+} (12y)$
6. $\lim_{h \rightarrow \infty} (-2h)$
7. $\lim_{x \rightarrow 2} (x^4 - 3x)$
8. $\lim_{x \rightarrow 3} \frac{x^2 - 2x}{x + 1}$
9. $\lim_{y \rightarrow 2^+} \frac{(y-1)(y-2)}{(y+1)}$
10. $\lim_{x \rightarrow 2^+} \sqrt{x}$
11. $\lim_{x \rightarrow 0^+} \sqrt{x}$
12. $\lim_{x \rightarrow 2} \sqrt{x-2}$
13. $\lim_{x \rightarrow 5} \sqrt{x-2}$
14. $\lim_{x \rightarrow 2^-} \sqrt[3]{x^3 - 8}$
15. $\lim_{x \rightarrow 4} \frac{(x^2 - 16)}{(x - 4)}$
16. $\lim_{t \rightarrow 2} \frac{(t^3 + 8)}{(t + 2)}$
17. $\lim_{x \rightarrow 1^+} \frac{(x^4 - 1)}{(x - 1)}$
18. $\lim_{x \rightarrow 2} \frac{(x^2 - 4x + 4)}{(x^2 + x - 6)}$
19. $\lim_{y \rightarrow -\infty} \frac{3}{(y + 4)}$
20. $\lim_{y \rightarrow 1^+} \frac{(y-1)(y-2)}{y+1}$
21. $\lim_{x \rightarrow \infty} \frac{(3x+1)}{(2x-5)}$
22. $\lim_{x \rightarrow \infty} \frac{1}{(x-12)}$
23. $\lim_{y \rightarrow \infty} \frac{3}{(y+4)}$
24. $\lim_{x \rightarrow -\infty} \frac{(5x^2 + 7)}{(3x^2 - x)}$
25. $\lim_{x \rightarrow -\infty} \frac{(x-2)}{(x^2 + 2x + 1)}$
26. $\lim_{x \rightarrow \infty} \frac{\sqrt{5x^2 - 2}}{(x + 3)}$
27. $\lim_{x \rightarrow \infty} \frac{\sqrt{5x^2 - 2}}{(x + 3)}$
28. $\lim_{x \rightarrow -\infty} \frac{(2-y)}{\sqrt{7+6y^2}}$
29. $\lim_{y \rightarrow \infty} \frac{(2-y)}{\sqrt{7+6y^2}}$
30. $\lim_{x \rightarrow 3^+} \frac{x}{(x-3)}$

$$31. \lim_{x \rightarrow 2^+} \frac{x}{(x^2 - 4)}$$

$$34. \lim_{x \rightarrow \infty} \frac{(7 - 6x^5)}{(x + 3)}$$

$$37. \lim_{x \rightarrow 3^-} \frac{1}{|x - 3|}$$

$$32. \lim_{y \rightarrow 6} \frac{(y + 6)}{(y^2 - 36)}$$

$$35. \lim_{t \rightarrow \infty} \frac{(5 - 2t^3)}{(t^2 + 1)}$$

$$38. \lim_{x \rightarrow 2^+} \frac{1}{\sqrt{x - 2}}$$

$$33. \lim_{x \rightarrow 4} \frac{(3 - x)}{(x^2 - 2x - 8)}$$

$$36. \lim_{t \rightarrow \infty} \frac{(6 - t^3)}{(7t^3 + 3)}$$

$$39. \lim_{x \rightarrow 2} \frac{(x - 2)}{(x^2 - 4x + 4)}$$

II. Miscellaneous:

$$40. f(x) = \begin{cases} x - 1, & x \leq 3 \\ 3x - 7, & x > 3 \end{cases}$$

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

$$(b) \lim_{x \rightarrow 3^+} f(x)$$

$$(c) \lim_{x \rightarrow 3} f(x)$$

$$41. h(x) = \begin{cases} x^2 - 2x + 1, & x \neq 3 \\ 7, & x = 3 \end{cases}$$

(a) draw a graph of $h(x)$

$$(b) \lim_{x \rightarrow 3} h(x)$$

$$42. F(x) = \begin{cases} \frac{x^2 - 9}{x + 3}, & x \neq -3 \\ k, & x = -3 \end{cases}$$

Find k so that $F(-3) = \lim_{x \rightarrow -3} F(x)$

III. Find All Asymptotes:

$$43. y = \frac{x^2 - 9}{x^2 - 1}$$

$$44. y = \frac{\sqrt{4x^2 + 1}}{x - 3}$$

$$45. y = \frac{3 - x}{\sqrt{x^2 - 9}}$$

$$46. y = \frac{x^2 - 9}{x - 3}$$

IV. Find a, b so that $f(x)$ is continuous:

$$47. \begin{cases} 2x - a, & x < -2 \\ ax + 2b, & -2 \leq x \leq 2 \\ b - 5x, & x > 2 \end{cases}$$

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LIMITS REVIEW WORKSHEET II

I. Find the limits:

1. $\lim_{x \rightarrow 2} (\sqrt{x-2})$

8. $\lim_{x \rightarrow 3^+} \left(\frac{x^2 - 9}{x^2 - 7x + 12} \right)$

15. $\lim_{x \rightarrow -\infty} \left(\frac{x^5 + 1}{3x^3 - 2} \right)$

2. $\lim_{x \rightarrow 3^+} (\sqrt{x-3})$

9. $\lim_{x \rightarrow 5^-} \left(\frac{x-5}{x^2 - 25} \right)$

16. $\lim_{x \rightarrow \infty} \left(\frac{4 - x^3}{x^2} \right)$

3. $\lim_{x \rightarrow 0} (\sqrt[3]{x})$

10. $\lim_{x \rightarrow \infty} \left(\frac{3x^2 - 7x}{6x^2 + 4} \right)$

17. $\lim_{x \rightarrow -\infty} \left(\frac{4 - x^3}{x^2} \right)$

4. $\lim_{x \rightarrow -2} (x^3 + 5x^2)$

11. $\lim_{x \rightarrow \infty} \left(\frac{x^3 + 5x}{3x^3 - 4} \right)$

18. $\lim_{x \rightarrow \infty} \left(\frac{2x - 4}{\sqrt{5x^2 + 1}} \right)$

5. $\lim_{x \rightarrow 3^+} \left(\frac{x+4}{x-5} \right)$

12. $\lim_{x \rightarrow \infty} \left(\frac{4x^2 + 2}{5x^3} \right)$

19. $\lim_{x \rightarrow -\infty} \left(\frac{2x - 4}{\sqrt{5x^2 + 1}} \right)$

6. $\lim_{x \rightarrow 3^+} \left(\frac{x-3}{x-2} \right)$

13. $\lim_{x \rightarrow -\infty} \left(\frac{x^4 - 1}{3x^5 + 2} \right)$

20. $\lim_{x \rightarrow 0^+} \left(\frac{x-1}{x} \right)$

7. $\lim_{x \rightarrow 3^+} \left(\frac{x-4}{x-3} \right)$

14. $\lim_{x \rightarrow \infty} \left(\frac{x^5 + 1}{3x^3 - 2} \right)$

21. $\lim_{x \rightarrow 3^-} \left(\frac{x-3}{x^2 - 6x + 9} \right)$

II. Graph:

Identify

- (a) All intercepts
(b) All asymptotes

- (c) Holes
(d) Graph

22. $f(x) = \frac{x^3 + 9x}{x^2}$

24. $h(x) = \frac{x^2 - 5x + 6}{x^2 - 2x - 3}$

26. $a(x) = \frac{x^3 - 8}{x^2 - 4}$

23. $g(x) = \frac{4x^2 - 9}{x}$

25. $a(x) = \frac{x^2 - 1}{x^3 - 1}$

ANSWERS TO LIM WKSH I

- | | |
|--------------------|----------------|
| (1) 7 | (34) $-\infty$ |
| (2) -3 | (35) ∞ |
| (3) π | (36) $-1/7$ |
| (4) -6 | (37) ∞ |
| (5) 36 | (38) ∞ |
| (6) $-\infty$ | (39) $-\infty$ |
| (7) 22 | (40) (a) 2 |
| (8) $3/4$ | (b) 2 |
| (9) 0 | (c) 2 |
| (10) $\sqrt{2}$ | (41) (a) |
| (11) 0 | |
| (12) $\emptyset$ | |
| (13) $\sqrt{3}$ | (b) 4 |
| (14) 0 | (42) $k=6$ |
| (15) 8 | (43) $x=1$ |
| (16) 12 | $x=-1$ |
| (17) 4 | $y=1$ |
| (18) 0 | (44) $x=3$ |
| (19) 0 | $y=2$ |
| (20) 0 | $y=-2$ |
| (21) $3/2$ | (45) $x=3$ |
| (22) 0 | $x=-3$ |
| (23) 0 | $y=1$ |
| (24) $5/3$ | $y=-1$ |
| (25) 0 | (46) none |
| (26) $-\sqrt{5}$ | (47) $a=-16/5$ |
| (27) $\sqrt{5}$ | $b=-18/5$ |
| (28) $1/\sqrt{6}$ | |
| (29) $-1/\sqrt{6}$ | |
| (30) ∞ | |
| (31) ∞ | |
| (32) $-\infty$ | |
| (33) ∞ | |

ANSWERS TO LIM WKSH II

- | |
|--------------------|
| (1) $\emptyset$ |
| (2) 0 |
| (3) 0 |
| (4) 12 |
| (5) $-7/2$ |
| (6) 0 |
| (7) $-\infty$ |
| (8) -6 |
| (9) $1/10$ |
| (10) $1/2$ |
| (11) $1/3$ |
| (12) 0 |
| (13) 0 |
| (14) ∞ |
| (15) ∞ |
| (16) $-\infty$ |
| (17) ∞ |
| (18) $2/\sqrt{5}$ |
| (19) $-2/\sqrt{5}$ |
| (20) $-\infty$ |
| (21) $-\infty$ |
| (22)-(26) OVER |

LIMIT REVIEW WORKSHEET III
AB CALCULUS AP

(1) $\lim_{x \rightarrow 3} (10)$

(12) $\lim_{x \rightarrow 0^-} \left(\frac{3x+4}{2x^4-7x+10} \right)$

(23) $\lim_{x \rightarrow -\infty} \left(\frac{x^3+10}{5x^2} \right)$

(2) $\lim_{x \rightarrow \infty} (-5)$

(13) $\lim_{x \rightarrow 5^+} \left(\frac{x^2-25}{x-5} \right)$

(24) $\lim_{s \rightarrow \infty} \sqrt[5]{\frac{4s^3-5s}{3s^3+2}}$

(3) $\lim_{x \rightarrow 0^+} (\pi)$

(14) $\lim_{t \rightarrow -3} \left(\frac{t^3+27}{t+3} \right)$

(25) $\lim_{x \rightarrow \infty} \left(\frac{\sqrt{3x^2-5x}}{4x+1} \right)$

(4) $\lim_{x \rightarrow -3} (-5x-x^2)$

(15) $\lim_{x \rightarrow 2^+} \left(\frac{x^4-16}{x-2} \right)$

(26) $\lim_{x \rightarrow -\infty} \left(\frac{\sqrt{3x^2-5x}}{4x+1} \right)$

(5) $\lim_{h \rightarrow 4^+} (12h-h^2)$

(16) $\lim_{m \rightarrow 3} \left(\frac{m^2-6m+9}{m^2-5m+6} \right)$

(27) $\lim_{x \rightarrow \infty} \left(\frac{2-3x}{\sqrt{3x^2+4}} \right)$

(6) $\lim_{y \rightarrow -\infty} \left(\frac{-3y}{4} \right)$

(17) $\lim_{x \rightarrow 3} \left(\frac{x^2+8x+15}{x^2-x-12} \right)$

(28) $\lim_{x \rightarrow -\infty} \left(\frac{2-3x}{\sqrt{3x^2+4}} \right)$

(7) $\lim_{x \rightarrow 4} \sqrt{x^3-3x-1}$

(18) $\lim_{x \rightarrow 2} \left(\frac{x^3-5x^2+2x+8}{x^2-10x+16} \right)$

(29) $\lim_{x \rightarrow \infty} \left(\frac{5x^2+2}{\sqrt{6x^4-3}} \right)$

(8) $\lim_{x \rightarrow 0^-} (x^5-25x^2+332)$

(19) $\lim_{x \rightarrow \infty} \left(\frac{3x^2-2x}{4x^2+10} \right)$

(30) $\lim_{x \rightarrow -\infty} \left(\frac{5x^2+2}{\sqrt{6x^4-3}} \right)$

(9) $\lim_{m \rightarrow -2} (m^4-12m+1)$

(20) $\lim_{x \rightarrow \infty} \left(\frac{2}{5x+4} \right)$

(31) $\lim_{x \rightarrow 3^+} \left(\frac{x-4}{x-3} \right)$

(10) $\lim_{x \rightarrow 5} \left(\frac{x^2-2x}{x+1} \right)$

(21) $\lim_{y \rightarrow -\infty} \left(\frac{4}{6y^2+2} \right)$

(32) $\lim_{x \rightarrow 3^-} \left(\frac{x-4}{x-3} \right)$

(11) $\lim_{y \rightarrow 3} \left(\frac{y^2-4y+3}{y+1} \right)$

(22) $\lim_{x \rightarrow -\infty} \left(\frac{5x^4-10}{3x^4+8x} \right)$

(33) $\lim_{x \rightarrow -2^-} \left(\frac{x+3}{x+2} \right)$

(34) $\lim_{x \rightarrow 2^+} \frac{x+3}{x+2}$

(38) $\lim_{x \rightarrow -\infty} \frac{2x^2-3}{x+1}$

(42) $\lim_{x \rightarrow 3^+} \sqrt{x-3}$

(35) $\lim_{x \rightarrow 4^-} \frac{x}{x^2-16}$

(39) $\lim_{x \rightarrow \infty} \frac{5x^4+2}{4x^4-3}$

(43) $\lim_{x \rightarrow 0^-} \sqrt{-x}$

(36) $\lim_{x \rightarrow 4^+} \frac{x}{x^2-16}$

(40) $\lim_{x \rightarrow 4^+} \frac{3-x}{x^2-2x-8}$

(44) $\lim_{x \rightarrow 2} \sqrt[3]{x-2}$

(37) $\lim_{x \rightarrow \infty} \frac{3x^3+5}{2-x}$

(41) $\lim_{x \rightarrow 0} \sqrt{x}$

(45) $\lim_{x \rightarrow 2^-} \sqrt{x-2}$

ANSWERS

(1) 10

(2) -5

(3) π

(4) 6

(5) 32

(6) ∞

(7) $\sqrt{51}$

(8) 332

(9) 41

(10) $15/6$

(11) 0

(12) $2/5$

(13) 10

(14) 27

(15) 32

(16) 0

(17) $-2/7$

(18) 1

(19) $3/4$

(20) 0

(21) 0

(22) $5/3$

(23) $-\infty$

(24) $\sqrt[3]{4/3}$

(25) $\sqrt{3}/4$

(26) $-\sqrt{3}/4$

(27) $-\sqrt{3}$ or $-3/\sqrt{3}$

(28) $\sqrt{3}$ or $-3/\sqrt{3}$

(29) $5/\sqrt{6}$

(30) $5/\sqrt{6}$

(31) $-\infty$

(32) ∞

(33) $-\infty$

(34) ∞

(35) $-\infty$

(36) ∞

(37) $-\infty$

(38) $-\infty$

(39) $5/4$

(40) $-\infty$

(41) $\emptyset$

(42) 0

(43) 0

(44) 0

(45) $\emptyset$