

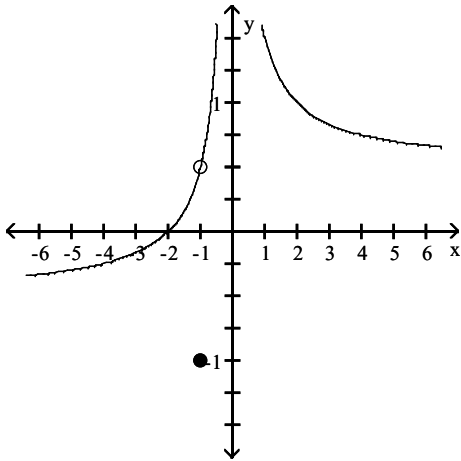
Each problem is worth 1 points unless otherwise specified. This Worksheet is worth 20 points.
 You MUST show your work to receive any credit. You may use any appropriate method to solve each problem.
 There is 1 built in bonus point.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use the graph to evaluate the limit.

1) $\lim_{x \rightarrow -1} f(x)$

1) _____



A) ∞

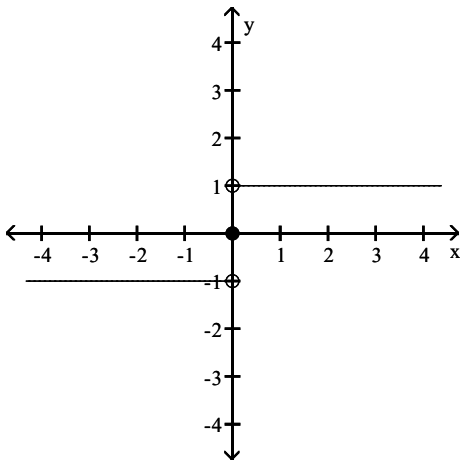
B) -1

C) $\frac{1}{2}$

D) $-\frac{1}{2}$

2) $\lim_{x \rightarrow 0} f(x)$

2) _____



A) does not exist

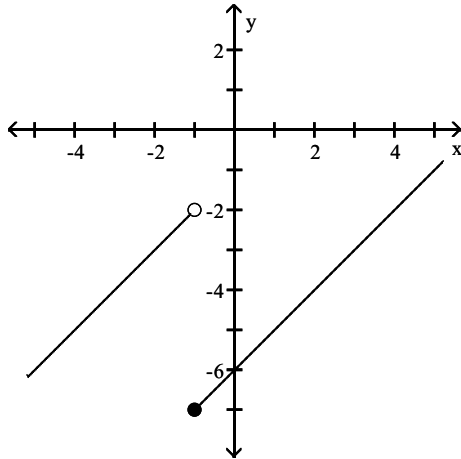
B) -1

C) 1

D) ∞

3) Find $\lim_{x \rightarrow (-1)^-} f(x)$ and $\lim_{x \rightarrow (-1)^+} f(x)$

3) _____



A) -2; -7

B) -7; -5

C) -7; -2

D) -5; -2

Use the table of values of f to estimate the limit.

4) Let $f(x) = x^2 + 8x - 2$, find $\lim_{x \rightarrow 2} f(x)$.

4) _____

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$						

A)

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$	5.043	5.364	5.396	5.404	5.436	5.763

; limit = ∞

B)

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$	5.043	5.364	5.396	5.404	5.436	5.763

; limit = 5.40

C)

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$	16.810	17.880	17.988	18.012	18.120	19.210

; limit = 18.0

D)

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$	16.692	17.592	17.689	17.710	17.808	18.789

; limit = 17.70

Find the limit.

5) $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x}$

5) _____

A) 1/4

B) Does not exist

C) 0

D) 1/2

6) $\lim_{x \rightarrow -1} \frac{x}{3x+2}$

6) _____

A) 0

B) does not exist

C) $-\frac{1}{5}$

D) 1

- 7) $\lim_{x \rightarrow 1} \frac{3x^2 + 7x - 2}{3x^2 - 4x - 2}$ 7) _____
- A) 0 B) $-\frac{8}{3}$ C) Does not exist D) $-\frac{7}{4}$

Determine the limit by sketching an appropriate graph.

- 8) $\lim_{x \rightarrow 5^+} f(x)$, where $f(x) = \begin{cases} -3x - 4 & \text{for } x < 5 \\ 2x - 3 & \text{for } x \geq 5 \end{cases}$ 8) _____
- A) 7 B) -3 C) -19 D) -2

- 9) $\lim_{x \rightarrow 3^-} f(x)$, where $f(x) = \begin{cases} \sqrt{1-x^2} & 0 \leq x < 1 \\ 1 & 1 \leq x < 3 \\ 3 & x = 3 \end{cases}$ 9) _____
- A) 0 B) 3 C) Does not exist D) 1

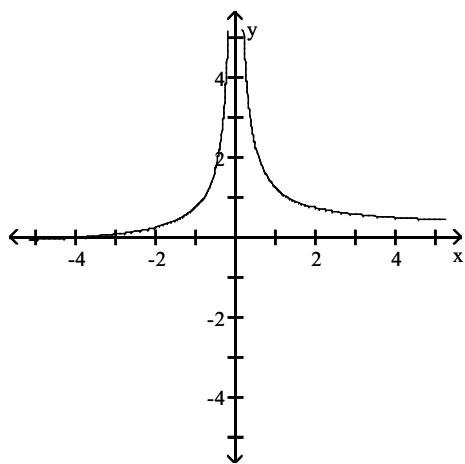
Find the limit, if it exists.

- 10) $\lim_{x \rightarrow -4} \frac{x^2 + 7x + 12}{x + 4}$ 10) _____
- A) 7 B) Does not exist C) -1 D) 56

- 11) $\lim_{x \rightarrow 7} \frac{|7-x|}{7-x}$ 11) _____
- A) 1 B) 0 C) -1 D) Does not exist

For the function f whose graph is given, determine the limit.

- 12) Find $\lim_{x \rightarrow 0} f(x)$. 12) _____



- A) 0 B) $-\infty$ C) ∞ D) 1

Find the limit.

- 13) $\lim_{x \rightarrow 5^+} \frac{2}{x^2 - 25}$ 13) _____
- A) ∞ B) 0 C) $-\infty$ D) 1

14) $\lim_{x \rightarrow -\infty} \frac{-2x^2 + 3x + 16}{-7x^2 - 7x + 6}$ 14) _____

A) ∞ B) 1 C) $\frac{8}{3}$ D) $\frac{2}{7}$

15) $\lim_{x \rightarrow -\infty} \frac{6x^3 + 3x^2}{x - 7x^2}$ 15) _____

A) $-\frac{3}{7}$ B) 6 C) $-\infty$ D) ∞

Divide numerator and denominator by the highest power of x in the denominator to find the limit.

16) $\lim_{x \rightarrow \infty} \frac{2\sqrt{x} + x^{-1}}{5x - 3}$ 16) _____

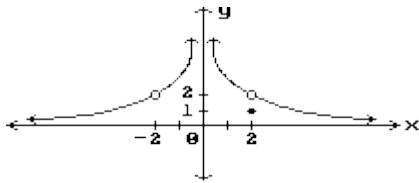
A) ∞ B) $\frac{2}{5}$ C) 0 D) $\frac{1}{5}$

17) $\lim_{x \rightarrow \infty} \frac{5x + 3}{\sqrt{3x^2 + 1}}$ 17) _____

A) $\frac{5}{3}$ B) ∞ C) 0 D) $\frac{5}{\sqrt{3}}$

Find all points where the function is discontinuous.

18) 18) _____



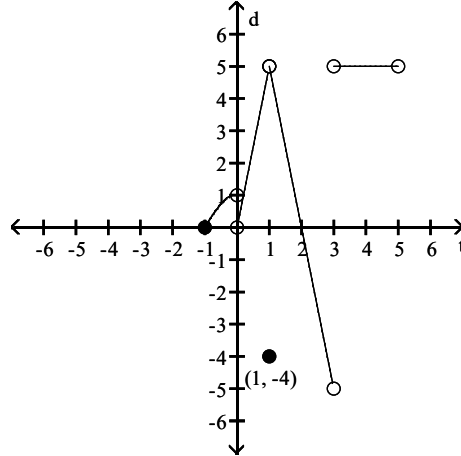
- A) $x = -2, x = 0$ B) $x = 0, x = 2$
 C) $x = -2, x = 0, x = 2$ D) $x = 2$

Provide an appropriate response.

19) Is f continuous at $f(3)$?

19) _____

$$f(x) = \begin{cases} -x^2 + 1, & -1 \leq x < 0 \\ 5x, & 0 < x < 1 \\ -4, & x = 1 \\ -5x + 10, & 1 < x < 3 \\ 5, & 3 < x < 5 \end{cases}$$



A) No

B) Yes

20) Is the function given by $f(x) = \begin{cases} x^2 + 4, & \text{for } x < 0 \\ 1, & \text{for } x \geq 0 \end{cases}$ continuous at $x = -5$? Why or why not?

20) _____

A) No, $\lim_{x \rightarrow -5} f(x) = f(-5)$ does not exist

B) Yes, $\lim_{x \rightarrow -5} f(x) = f(-5)$

Find numbers a and b , or k , so that f is continuous at every point.

21)

21) _____

$$f(x) = \begin{cases} 6, & x < -5 \\ ax + b, & -5 \leq x \leq -3 \\ -4, & x > -3 \end{cases}$$

A) $a = -5, b = 11$

B) $a = -5, b = -19$

C) $a = 6, b = -4$

D) Impossible