

Each problem is worth 1 points unless otherwise specified. This Worksheet is worth 24 points.

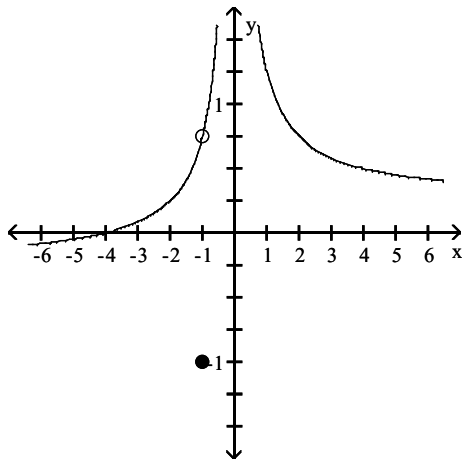
You MUST show your work to receive any credit. You may use any appropriate method to solve each problem.

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) $\frac{3}{4}$

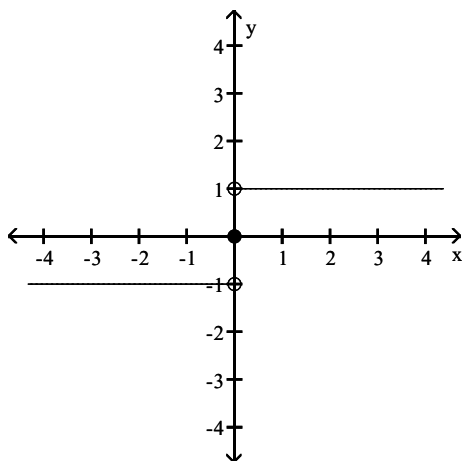
B) ∞

C) $-\frac{3}{4}$

D) -1

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

2) _____



A) ∞

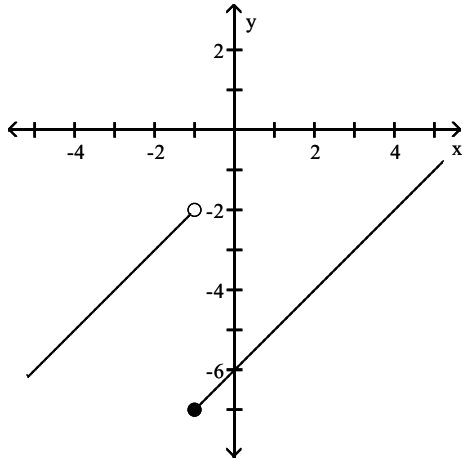
B) does not exist

C) 1

D) -1

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

3) _____



A) -7; -2

B) -5; -2

C) -7; -5

D) -2; -7

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 = 5.40

B)

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

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
$f(x)$	5.043	5.364	5.396	5.404	5.436	5.763

; limit = ∞

Find the limit.

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

5) _____

A) 0

B) 1/2

C) Does not exist

D) 1/4

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

6) _____

A) does not exist

B) 0

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

D) 1

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

Determine the limit by sketching an appropriate graph.

- 8) $\lim_{x \rightarrow 6^+} f(x)$, where $f(x) = \begin{cases} -2x + 4 & \text{for } x < 6 \\ 2x + 5 & \text{for } x \geq 6 \end{cases}$ 8) _____
- A) 6 B) -8 C) 17 D) 5

- 9) $\lim_{x \rightarrow 5^-} f(x)$, where $f(x) = \begin{cases} \sqrt{16 - x^2} & 0 \leq x < 4 \\ 4 & 4 \leq x < 5 \\ 5 & x = 5 \end{cases}$ 9) _____
- A) 5 B) 0 C) Does not exist D) 4

Find the limit, if it exists.

- 10) $\lim_{x \rightarrow -7} \frac{x^2 + 16x + 63}{x + 7}$ 10) _____
- A) Does not exist B) 16 C) 2 D) 224

- 11) $\lim_{x \rightarrow 8} \frac{|8 - x|}{8 - x}$ 11) _____
- A) 0 B) 1 C) -1 D) Does not exist

Provide an appropriate response.

- 12) It can be shown that the inequalities $-x \leq x \cos\left(\frac{1}{x}\right) \leq x$ hold for all values of $x \geq 0$. 12) _____

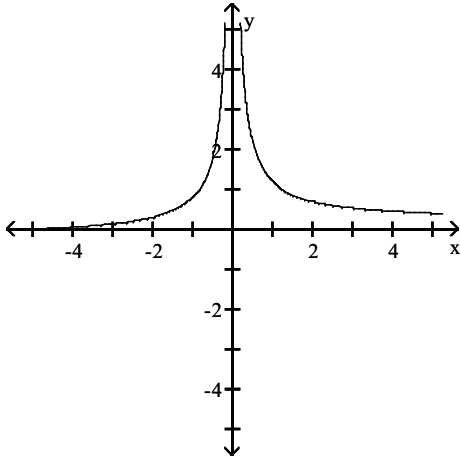
Find $\lim_{x \rightarrow 0} x \cos\left(\frac{1}{x}\right)$ if it exists.

- A) 0 B) does not exist C) 1 D) 0.0007

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

13) Find $\lim_{x \rightarrow 0} f(x)$.

13) _____



A) $-\infty$

B) ∞

C) 1

D) 0

Find the limit.

14) $\lim_{x \rightarrow 0} (1 - \cot x)$

14) _____

A) 0

B) ∞

C) $-\infty$

D) Does not exist

15) $\lim_{x \rightarrow 4^+} \frac{5}{x^2 - 16}$

15) _____

A) 0

B) 1

C) ∞

D) $-\infty$

16) $\lim_{x \rightarrow -\infty} \frac{-5x^2 - 5x + 9}{-2x^2 - 7x + 3}$

16) _____

A) 3

B) ∞

C) 1

D) $\frac{5}{2}$

17) $\lim_{x \rightarrow \infty} \frac{\cos 2x}{x}$

17) _____

A) $-\infty$

B) 0

C) 2

D) 1

18) $\lim_{x \rightarrow -\infty} \frac{3x^3 + 4x^2}{x - 6x^2}$

18) _____

A) 3

B) ∞

C) $-\infty$

D) $-\frac{2}{3}$

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

19) $\lim_{x \rightarrow \infty} \frac{4\sqrt{x} + x^{-1}}{-3x + 4}$

19) _____

A) $-\frac{4}{3}$

B) $\frac{1}{-3}$

C) ∞

D) 0

20) $\lim_{x \rightarrow \infty} \frac{10x + 3}{\sqrt{3x^2 + 1}}$

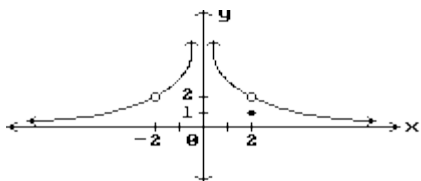
20) _____

- A) ∞ B) $\frac{10}{3}$ C) $\frac{10}{\sqrt{3}}$ D) 0

Find all points where the function is discontinuous.

21)

21) _____



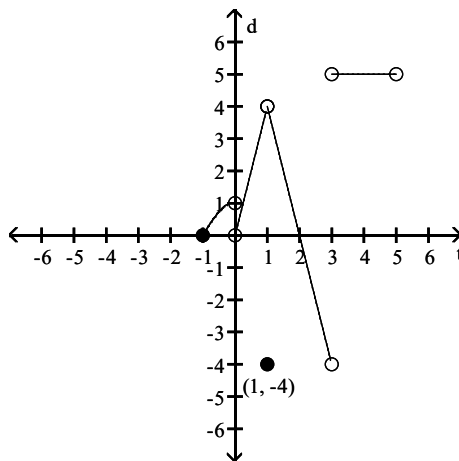
- A) $x = -2, x = 0$ B) $x = 2$
 C) $x = -2, x = 0, x = 2$ D) $x = 0, x = 2$

Provide an appropriate response.

22) Is f continuous at $f(0)$?

22) _____

$$f(x) = \begin{cases} -x^2 + 1, & -1 \leq x < 0 \\ 4x, & 0 < x < 1 \\ -4, & x = 1 \\ -4x + 8, & 1 < x < 3 \\ 5, & 3 < x < 5 \end{cases}$$



- A) No B) Yes

23) Is the function given by $f(x) = \begin{cases} x^2 + 1, & \text{for } x < 0 \\ -1, & \text{for } x \geq 0 \end{cases}$ continuous at $x = -3$? Why or why not?

23) _____

- A) Yes, $\lim_{x \rightarrow -3} f(x) = f(-3)$ B) No, $\lim_{x \rightarrow -3} f(x) = f(-3)$ does not exist

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

24)

24) _____

$$f(x) = \begin{cases} -25, & x < -2 \\ ax + b, & -2 \leq x \leq 3 \\ -10, & x > 3 \end{cases}$$

- A) $a = 3, b = -1$ B) $a = -25, b = -10$ C) $a = 3, b = -19$ D) Impossible