



Subject: Calculus

Chapter: Unit 1

Category: Practice questions

Chapter 1

1. Construct a table of at least 4 ordered pairs of points on the graph of the function and use the ordered pairs from the table to sketch the graph of the function.

$$f(x) = \sqrt{x+1}$$

2. Given $A(x) = \sqrt[5]{2x+11}$ find $A^{-1}(x)$

3. Use transformations to sketch the graph of the following function: $f(x) = |x+2|$

4. Given $f(x) = 6x+2$ and $g(x) = 10-7x$ compute each of the following.

(a) $(f-g)(2)$

(b) $(g-f)(2)$

(c) $f \circ g$

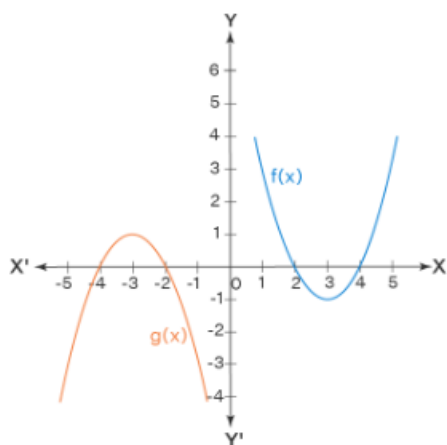
(d) $\left(\frac{f}{g}\right)(x)$

5. Using ordered pairs of points sketch the graph of the following function.

$$f(x) = \begin{cases} 10-2x & \text{if } x < 2 \\ x^2 + 2 & \text{if } x \geq 2 \end{cases}$$

6. Use transformations to sketch the graph of the following function: $f(x) = |x-7| + 2$

7. Write the function corresponding to the graph of $g(x)$ that transformed from the graph $f(x)$ by using the function transformation rules



8. If a function $f(x)$ is translated 3 units left and 4 units upward, then which of the following is the new function?

9. Find the inverse function of the function $f(x) = 5x + 4$.

10. Which of the following functions are even function?

- A. $\cos x$
- B. x^2
- C. $\sin x$
- D. x

11. Perform the indicated function evaluations for $f(x) = 3 - 5x - 2x^2$

1. $f(-3)$
2. $f(7 - 4x)$

12. Identify the function which is a reflection of the following function and draw its graph : $f(x) = x^3 + 1$

13. Find the inverse of the function $f(x)=2x^3+1$.

14. Find the inverse of the function $f(x)=\frac{x+2}{x-2}$

15. If $h(x)=e^x+x+1$, find $h^{-1}(2)$.

Chapter 2

For problems 1 – 4 evaluate the limit, if it exists.

1. $\lim_{x \rightarrow 2} (8 - 3x + 12x^2)$

2. $\lim_{t \rightarrow -3} \frac{6+4t}{t^2+1}$

3. $\lim_{z \rightarrow 8} \frac{2z^2-17z+8}{8-z}$

4. $\lim_{h \rightarrow 0} \frac{(6+h^2)-36}{h}$

5. Given the function

$$f(x) = \begin{cases} 7 - 4x & \text{if } x < 1 \\ x^2 + 2 & \text{if } x \geq 1 \end{cases}$$

Evaluate the following limits, if they exist.

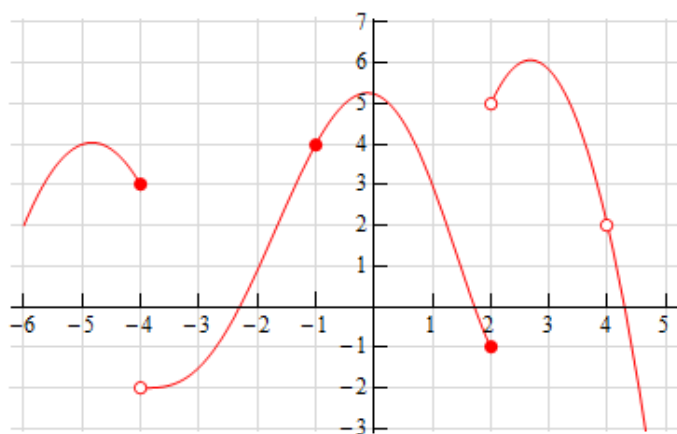
(a) $\lim_{x \rightarrow -6} f(x)$ (b) $\lim_{x \rightarrow 1} f(x)$

6. Below is the graph of $f(x)$. For each of the given points determine the value of $f(a)$,

$$\lim_{x \rightarrow a^-} f(x), \lim_{x \rightarrow a^+} f(x) \text{ and } \lim_{x \rightarrow a} f(x)$$

If any of the quantities do not exist clearly explain why.

- a) $a = -4$
- b) $a = -1$
- c) $a = 2$
- d) $a = 4$

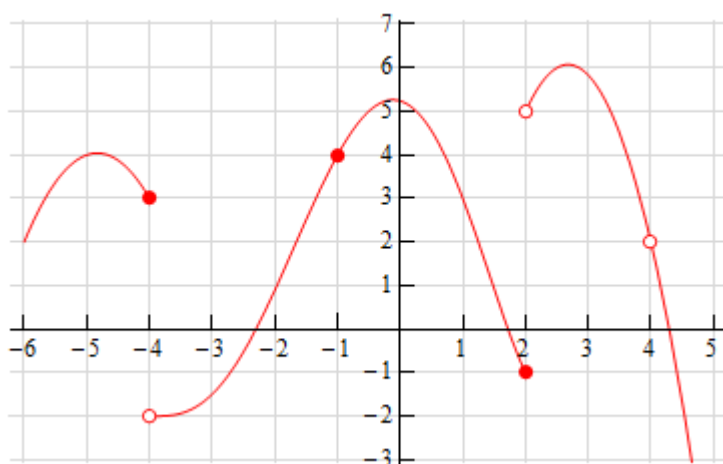


7. Sketch a graph of a function that satisfies each of the following conditions.

$$\lim_{x \rightarrow 2^-} f(x) = 1, \lim_{x \rightarrow 2^+} f(x) = -4 \text{ and } f(2) = 1$$

8. Evaluate $\lim_{x \rightarrow \infty} \frac{x}{\sqrt{1+2x^2}}$

9. The graph of $f(x)$ is given below. Based on this graph determine where the function is discontinuous.



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10. For the following questions using only the limit properties, one-sided limit properties (if needed) and the definition of continuity determine if the given function is continuous or discontinuous at the indicated points.

i. $f(x) = \frac{4x+5}{9-3x}$

(a) $x = -1$, (b) $x = 0$, (c) $x = 3$

11. For which of the following does $\lim_{x \rightarrow \infty} f(x) = 0$?

I. $f(x) = \frac{\ln x}{x^{99}}$

II. $f(x) = \frac{e^x}{\ln x}$

12. If $f(x) = \begin{cases} 2x - 1, & x \leq 1 \\ -3x + 1, & x > 1 \end{cases}$, determine if $f(x)$ is continuous at $x=1$