

Problems #1-13 are 5 points each. Problem #14 is 15 points.

1. What is the domain of the function $f(x) = \sqrt{3x-4}$?
 - a. $\left[\frac{4}{3}, \infty\right)$
 - b. $\left(\frac{4}{3}, \infty\right)$
 - c. $\left(-\infty, \frac{3}{4}\right)$
 - d. all real numbers

2. Suppose the graph of f is given. Describe how the graph of $3f(-x)$ is obtained.
 - a. Reflect $f(x)$ over the y -axis, stretch the resulting graph by a factor of 3.
 - b. Shift $f(x)$ 3 units to the right, reflect the resulting graph over the x -axis.
 - c. Reflect $f(x)$ over the y -axis, compress the resulting graph by a factor of 3.
 - d. Reflect $f(x)$ over the x -axis, shift the resulting graph 3 units to the left.

3. If $f(x) = x - 6$, $g(x) = \sqrt{x}$, $h(x) = x^5$, find $f \circ g \circ h$.
 - a. $\sqrt{x-6}^5$
 - b. $(\sqrt{x}-6)^5$
 - c. $\sqrt{x^5-6}$
 - d. $\sqrt{x^5}-6$

4. Which functions are odd: I) $f(x) = x^5 + 8x$, II) $g(x) = \tan x + 1$?
 - a. II
 - b. I
 - c. neither
 - d. I and II

5. What is the range of $f(x) = \sqrt{5x-6}$?
- $[\frac{6}{5}, \infty)$
 - $[0, \infty)$
 - $(-\infty, \frac{6}{5}]$
 - all real numbers
6. Solve $|x-4| \geq 18$.
- $x \geq 22$
 - $x \geq 4$
 - $x \geq 22, x \leq -14$
 - $x \geq 14$
7. Find $\lim_{x \rightarrow 0} \frac{\cos x}{3x}$.
- Infinity
 - undefined
 - 1
 - 0
8. Given $f(x) = \begin{cases} 2x-5, & x \leq 3 \\ 2x^2, & x > 3 \end{cases}$, find $\lim_{x \rightarrow 3^+} f(x)$.
- 5
 - 18
 - 1
 - 3
9. Evaluate $\lim_{x \rightarrow -4} \frac{3|x+4|}{x+4}$.
- does not exist
 - 3
 - 0
 - 3

10. Evaluate $\lim_{x \rightarrow 0} \frac{x^2 - 2x - 32}{x^2 + 5x + 4}$.

- a. 0
- b. -2/5
- c. 1
- d. -8

11. Evaluate $\lim_{x \rightarrow -4} \frac{x^2 - 4x - 32}{x^2 + 5x + 4}$.

- a. -4/5
- b. does not exist
- c. 1
- d. 0
- e. 4

12. $f(x) = \begin{cases} \frac{4kx}{x-1}, & x < -1 \\ x-k, & x \geq -1 \end{cases}$, for what value of k is f(x) continuous?

- a. 3
- b. -1/3
- c. -3
- d. 0

13. Which function below is continuous for all real numbers?

a. $f(x) = \sqrt{x^2 - 36}$

b. $f(x) = \sec x$

c. $f(x) = x^3 - 2x^2 + \sqrt{53}$

d. $f(x) = \frac{x+2}{2x-15}$

14. Use the ϵ - δ definition of the limit to prove that $\lim_{x \rightarrow 3} (2x + 1) = 7$. Illustrate with a graph.