

Follow the instructions for each question and show enough of your work so that I can follow your thought process. If I can't read your work, answer or there is no justification to a solution, you will receive little or no credit!

For problems 1 and 2, find the equation of the line through the given points. Write the equation in slope-intercept form or standard form.

1. Through the points  $(-3, 2)$  and  $(9, 6)$ .

2. Through the points  $(7, 3)$  and  $(12, 10)$ .

For problems 3 and 4, find the domain of the following functions:

3.  $f(x) = \frac{x^2 + 1}{\sqrt{x^2 - 3x + 2}}$

4.  $f(x) = \frac{\sqrt{x - 7}}{x^2 - 5x - 14}$

For problems 5 and 6, graph the following equations on the same axes:

5.  $y = |x - 1|$  and  $y = x^2 - 1$

6.  $y = \sqrt{x - 2}$  and  $y = |x - 2|$

For problems 7 and 8, find the limits provided they exist:

7.  $\lim_{x \rightarrow 1} \frac{x^4 - 1}{x^2 - 1}$

8.  $\lim_{x \rightarrow 2} \frac{x^2 - 3x + 2}{x^2 - 5x + 6}$

For problems 9 and 10, determine if the following functions are continuous at the given point:

9.  $f(x) = \begin{cases} \frac{x^2 - 1}{x - 1} & \text{if } x \neq 1 \\ -23 & \text{if } x = 1 \end{cases}$  at the point  $x = 1$ .

10.  $f(x) = \begin{cases} \frac{\sqrt{x}-1}{x-1} & \text{if } x \neq 1 \\ \frac{1}{2} & \text{if } x = 1 \end{cases}$  at the point  $x = 1$ .

For problems 11 and 12, determine if the following limits exist or not. If they exist compute them, otherwise explain why the limit does not exist:

11.  $\lim_{x \rightarrow 0} \frac{|x|}{x}$

12.  $\lim_{x \rightarrow -2} \frac{x^3 + 8}{x^2 - 4}$

13. Compute the following limit, provide it exists:  $\lim_{x \rightarrow 0} \frac{\sqrt{4+x} - \sqrt{4-x}}{x}$