

Calculus 1 Worksheet 7
3 – Part Definition of Continuity

Show (THREE STEPS) that each of the following functions is either continuous or discontinuous at the given value of x.

1. $f(x) = x + 5$ at $x = 1$	2. $f(x) = x^2 + 2x - 1$ at $x = 0$
3. $f(x) = \frac{x^2 - 16}{x - 4}$ at $x = 4$	4. $f(x) = \frac{x^2 - 25}{x + 5}$ at $x = 5$
5. $f(x) = [x]$ at $x = 2$	6. $f(x) = \frac{ x + 1 }{x}$ at $x = 2$
7. $f(x) = \frac{1}{x}$ at $x = 3$	8. $f(x) = \frac{3x - 1}{2x + 6}$ at $x = -3$

State whether each function is continuous or discontinuous for all x. Justify your answer.

9. $f(x) = x^2 + 2$	10. $f(x) = \frac{1}{x}$
11. $f(x) = \frac{x^2 + 1}{x - 1}$	12. $f(x) = x - 1 $

Each of the following has point discontinuity. Assign values to $f(x)$ that remove the discontinuity.

13. $f(x) = \frac{x^2 - 4}{x - 2}$	14. $f(x) = \frac{x^2 - 5x + 6}{x - 3}$
15. $f(x) = \frac{x^2 - 5}{x - \sqrt{5}}$	16. $f(x) = \frac{x^3 + 8}{x + 2}$

Give the open interval(s) for which each function is continuous.

17. $f(x) = \frac{3x - 5}{2x^2 - x - 3}$	18. $f(x) = \sqrt{2x - 3} + x^2$
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