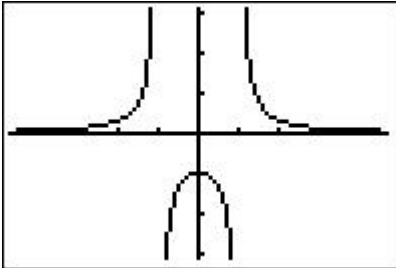


CONTINUITY EXERCISES – ANSWERS

Graph each function and find all real number values at which the given functions are discontinuous.

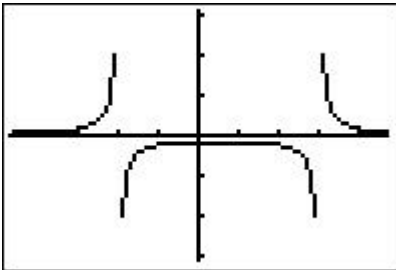
1. $f(x) = \frac{1}{x^2 - 1} = \frac{1}{(x+1)(x-1)}$

Discontinuous at $x = -1$ & $x = 1$.



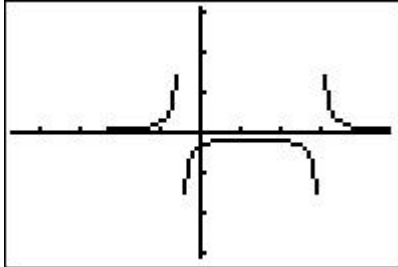
2. $f(x) = \frac{1}{x^2 - x - 6} = \frac{1}{(x-3)(x+2)}$

Discontinuous at $x = -2$ & $x = 3$.



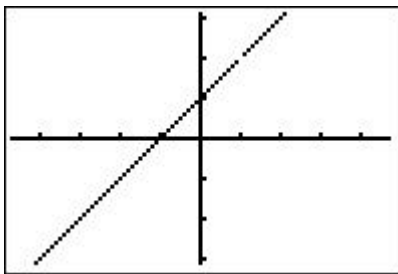
$$3. f(x) = \frac{1}{2x^2 - 5x - 3} = \frac{1}{(2x+1)(x-3)}$$

Discontinuous at $x = -1/2$ & $x = 3$.



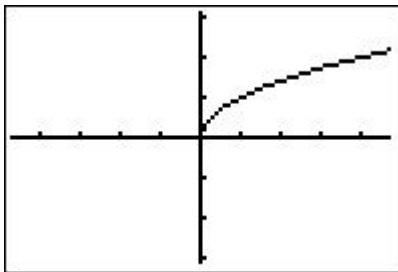
$$4. f(x) = \frac{x^2 - 1}{x - 1} = \frac{(x+1)(x-1)}{(x-1)} = x+1, \text{ if } x \neq 1$$

Discontinuous at $x = 1$.



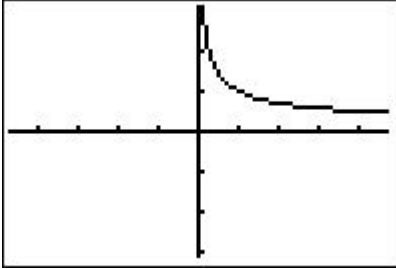
$$5. f(x) = \sqrt{x}$$

Discontinuous at $x < 0$.



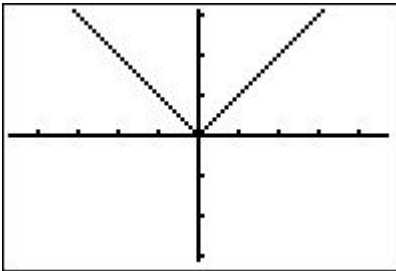
6. $f(x) = \frac{1}{\sqrt{x}}$

Discontinuous at $x \leq 0$.



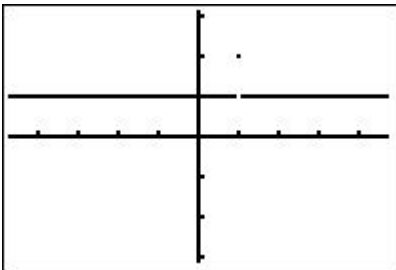
7. $f(x) = |x|$

Discontinuous nowhere.
Continuous at all real numbers.



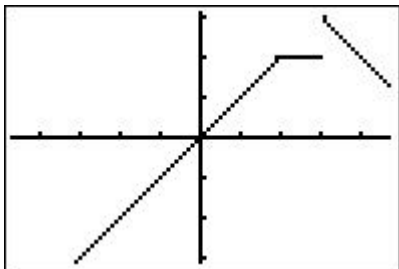
8. $f(x) = \begin{cases} 1 & \text{if } x \neq 1 \\ 2 & \text{if } x = 1 \end{cases}$

Discontinuous at $x = 1$.



$$9. f(x) = \begin{cases} x & \text{if } x < 2 \\ 2 & \text{if } 2 \leq x \leq 3 \\ -x + 6 & \text{if } x > 3 \end{cases}$$

Discontinuous at $x = 3$.



$$10. f(x) = \begin{cases} x & \text{if } x < 2 \\ 2 & \text{if } 2 \leq x \leq 3 \\ -x + 5 & \text{if } x > 3 \end{cases}$$

Discontinuous nowhere.
Continuous at all real numbers.

