

# Domains

Anton 2.1

Find the domain of a given function.

$f(x) = x^4 - 3x^2 + 4x$

D: ALL REALS  
IR  
 $(-\infty, \infty)$

POLYNOMIAL FUNCTIONS: DOMAIN = IR

**Objectives:**

- Given a function, find the domain algebraically.
- Given a function, find the domain graphically.

**Domain:** POSSIBLE VALUES OF THE INDEPENDENT VARIABLE ( $x$ )



### Find the domain.

$f(x) = x^4 - 3x^2 + 4x$

D: ALL REALS  
IR  
 $(-\infty, \infty)$

POLYNOMIAL FUNCTIONS: DOMAIN = IR

Find the domain of a given function.

$f(x) = \sqrt{x} = x^{1/2}$

D:  $x \geq 0$

$[0, \infty)$

CMPTRM:

**Find the domain.**

$$f(x) = \sqrt{x} = x^{1/2}$$

$$D: x \geq 0$$

$$[0, \infty)$$

CMPTRM:

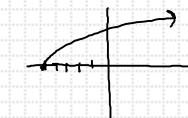


$$f(x) = \sqrt{x+5}$$

$$D: x+5 \geq 0$$

$$x \geq -5$$

$$[-5, \infty)$$



Find the domain of a given function.



**Find the domain.**

$$f(x) = \sqrt{x^2 + 4x + 3}$$

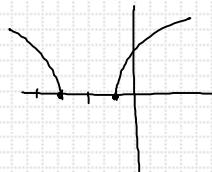
$$D: x^2 + 4x + 3 \geq 0$$

$$(x+3)(x+1) \geq 0$$

$$x = -3, -1$$



$$(-\infty, -3] \cup [-1, \infty)$$

CONFIRM GRAPHICALLY

Find the domain of a given function.

**Find the domain.**

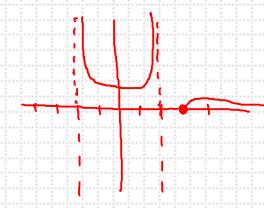
$$f(x) = \sqrt{\frac{x-3}{x^2-4}}$$

$$D: \frac{x-3}{x^2-4} \geq 0$$

$$\frac{x-3}{(x-2)(x+2)} \geq 0$$



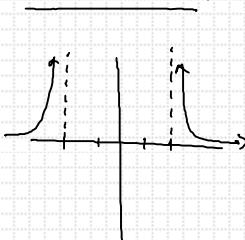
$$(-2, 2) \cup [3, \infty)$$

CONFIRM GRAPHICALLY

Find the domain of a given function.

**Find the domain.**

$$f(x) = \frac{1}{\sqrt{x^2 - 4}}$$

CONFIRM GRAPHICALLY

$$D: x^2 - 4 > 0$$

$$(x-2)(x+2) > 0$$



$$(-\infty, -2) \cup (2, \infty)$$

Find the domain of a given function.

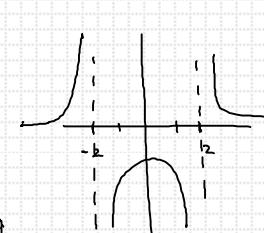
**Find the domain.**

$$f(x) = \frac{1}{x^2 - 4}$$

$$D: x^2 - 4 \neq 0$$

$$x \neq 2, -2$$

$$(-\infty, -2) \cup (-2, +2) \cup (2, \infty)$$



Find the domain of a given function.



**Classwork:**

**Section 2.1 WS #3-10**

**Homework:**

**p. 59 #5-10,23-31 odd**

